PERFORMANCE BUILDING UPGRADING GAMING

atomic

MAXIMUM POWER COMPUTING

$5.95 www.atomicmpc.com.au Proudly Australian Issue 19 Aug 02

THE WORLD'S COOLEST COMPUTERS

TOP GUN FUN – INSIDE RAAF HQ

FIND YOUR BOTTLENECK CPU VS VIDEO UPGRADING

SMASH IT SHOW AMD Hammer unveiled

FASTER HARD DRIVING Serial ATA doubles speeds

CITY-WIDE NETWORK Broadband renegades

GEFORCE 4 MX R.I.P SiS Xabre400: cheaper & faster

WIN: Gigabyte 128MB RADEON 8500

$AUD5.95 Inc. GST
$NZ7.95 Inc. GST

9 771444 899000 19

ISSN 1444-8998

AOpen

TubeSound

POWER UP
AX4B-533 Tube

AOpen JukeBox CD Player

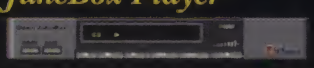
- 1845E support 400/ 533 MHz P4 CPU/ DDR 266
- Realtek LAN on board
- 5.1 Channel audio +Vacuum Tube Sound
- EZWinFlash
- Dr. Voice Debug function
- 1 MHz Stepping CPU Frequency
- AGP Protection Technology

DDR

Tube

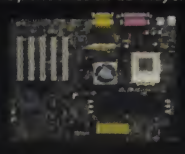
AOpen perfectly integrates vacuum tube on sound effect, making your PC a modern-dassical work of art.

JukeBox Player



With this smart AOpen design, you can enjoy the music without entering operating system, turning your PC into a convenient stereo system

AK77-333
AOpen JukeBox CD Player



- VIA KT333 support AMD Athlon XP & Duron/ DDR 333
- 5.1 Channel audio +USB2.0
- North Bridge Cooler
- Dr. Voice Debug function
- 1 MHz Stepping CPU Frequency

AX4G Pro
AOpen JukeBox CD Player

- Intel 845G support DDR333
- Support SKT478 400/533FSB
- Dr. Voice debug
- Realtek Lan onboard
- 5.1 Channel Audio, US82.0
- 1Mhz FSB Stepping

MX46L

- SiS 650GX+DDR266+FSB400
- ATA133
- Integrated VGA, AC97 Audio
- 4x AGP slot
- Realtek 10/100 Lan onboard

MX4LR

- Intel 845GL support DDR266
- Support SKT478 400FSB
- On-die Graphic + ADD slot
- Audio and LAN on board
- USB 2.0

Manufactured by:

AOpen®

Solutions · Components

www.aopen.com.tw

Bluechip Infotech Pty Ltd
Tel: 61-2-8745-8400
Fax: 61-2-8745-8499
Email: Lesliel@bluechipit.com.au

COMPUTER ct PC PC PC WORLD SOUNDMAX

LINKSYS

the world leader in ADSL modem market share and U.S SMB networking . . .

has come down under.

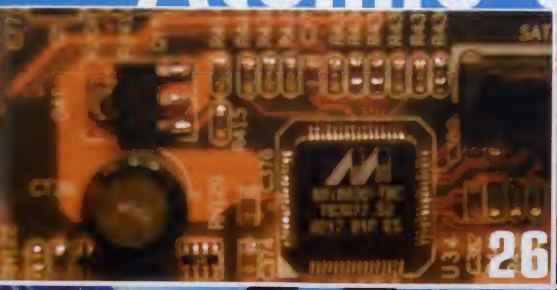
Linksys has become the leader in sales of wireless, routers, network cards and USB adapters to the Home and Small business user through retail and e-commerce channels. If you've visited an electronics or computer store or shopped online lately, you'll see why Linksys is the home and small/medium business networking leader, owning more than 30% of the Retail store market and leading in networking sales, through e-tailers. Linksys has also grown to become the fastest growing networking vendor in the distribution channel, which caters to small/medium businesses, corporate workgroups and enterprise environments through VARs and catalogs.

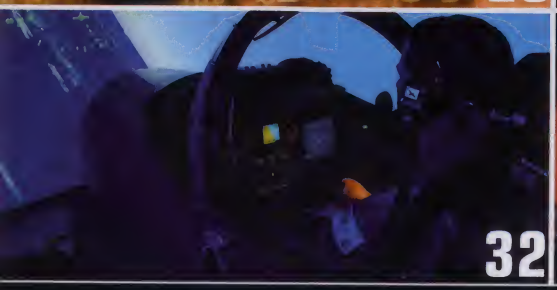
Contact BlueChip Infotech on 02 8745 8400 or email linksys@bluechipit.com.au

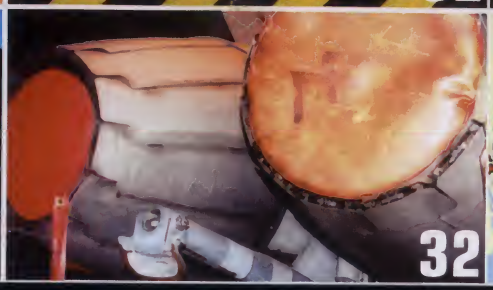
bluechip infotech

servex

Atomic contents issue 19







X-RAY: SERIAL ATA 26

Sucking down those 1s and 0s faster than ever before, and it's only going to get faster.

HEAD TO HEAD: CPU VERSUS VIDEO CARD 28

Which upgrade will give you more bang for your buck – a new CPU or video card?

FEATURE: THE FUTURE OF FLIGHT SIMS 32

You think your lightweight PC flight simulator is hardcore? Wait until you see the RAAF's new Hawk simulator in action.

FEATURE: WIRELESS COMMUNITIES 38

Say goodbye to the old tin can and string setup. We look at the wireless communities springing up throughout Australia's cities.

FEATURE: COMPUTEX 2002 42

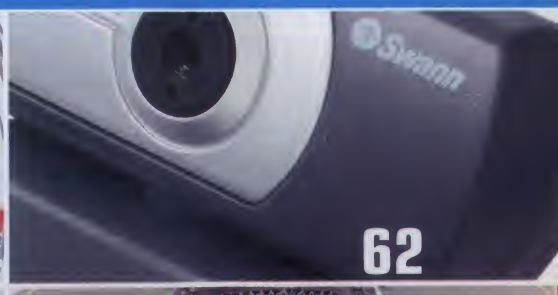
What do you get when you cram several thousand hardware manufacturers and a couple of hundred thousand attendees into a Taiwanese labyrinth? Computex 2002.

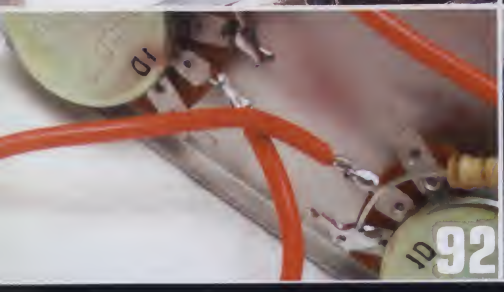
TUTORIAL: THE HEAVY WATER PROJECT III 86

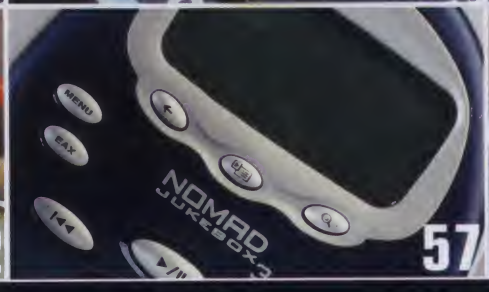
It's time to add the flux capacitor to your time travelling tower of doom. Not really, but building your own fan bus is almost as fun, and shouldn't rip a hole in time/space.

TUTORIAL: CASELIGHT II: DISCO INFERNO 92

What could be better than building your own LED array? Why, building one with eyeball-melting, high power LEDs, of course.







SCANNER 20

The Sims Online; Civ III: Play the World; Far Cry; Republic; RollerCoaster Tycoon II; Stronghold: Crusaders and Xbox Live.

NEWS 08

Technica Obscura – Jinxed 12
Z-Access – Nylon sandwich 14
Ground Zero – Max head room 16

HOT BOX 18

Just when you thought we'd run out, here's four more.

I/O 82

Read and learn from other people's problems.

COMPETITIONS 94

It makes us feel good to give you free stuff. Help us feel like our meaningless lives matter by entering all of our competitions.

POST APOCALYPSE 96

Atomicans can be a passionate bunch. If you don't trust this contents page teaser, head over to page 96 to become a believer.

FALLOUT 106

Hate the Oreo kid? Don't we all.

GAMES 68

Warcraft III: Reign of Chaos 70
The Elder Scrolls III: Morrowind 72
Age of Wonders II: The Wizards Throne 74
Final Fantasy X 76
Neverwinter Nights 78
Medal of Honor: Frontline 79

REVIEWS 46

Atomic benchmarks 48
Framerate 50
Triplex Xabre400 52
XoXide PC Tachometer 54
ABIT Media XP 54
Juzt-Reboot PCI-NT 55
WinTasks 4 Professional 55
Jaton SoundPlus 5.1 56
Sony PEG-NR70V CLIE 56
Creative Nomad Jukebox 3 57
LaCie Fusion CD-RW 24x12x40x 57
DACAL CD Library 59
AOpen H600A 59
Gigabyte GA-8IGX 60
Jaton X-Media DreamBox 62
SWANN VersaCam MINI 62
Cooler Master ATC600 64
Hercules Prophetview 920DVi 64
Triplex GeForce4 Ti4600 66
Gigabyte AP128DG-H 67

SUBSCRIPTIONS 80

Subscribing just plain feels good. It's about pride and satisfaction, belonging to a community, and home delivery.

The heat is on

The Parhelia engineering sample, which Matrox would not allow us to benchtest or photograph, but was the basis of our technology piece last month, had a ginormous heatsink fan (HSF) attached to it. Almost CPU size, it was. Now that the retail card is out, we find that the HSF is more traditionally sized, as expected. Why the sample had such a huge cooler I'm not sure, but, GPUs are only going to get hotter, and it won't be too long before their cooling devices resemble those we're seeing on CPUs. Leadtek's GeForce4 Ti4600 is almost there already. Its wrap-around Aluminium shroud with twin fans is overkill, but it's likely the way of the future.

But what of CPUs themselves? The engineering principles behind the HSF are elementary: put as much surface area as possible on top of the CPU to reduce the overall temperature, then blow as much air you can onto it to dissipate the heat.

In the old days, in a more sensible age when CPU temps were merely luke-warm, the traditional row of spikes was sufficient, if somewhat less sexy. Then came the Orb. It was designed, I'm sure, partially for aesthetics (nothing wrong with that), but also to meet the need to cool CPUs that were creeping up the temperature scale. Then it all went crazy. Orbs got taller, twin fans became common and they appeared in lots of pretty colours — which I'm sure helped cooling enormously. Fan speeds crept up towards 7,000RPM. And then Aluminium was no longer an efficient enough heat conductor. Aluminium sinks with copper cores were used, with a fairly quick evolution into pure copper heatsinks. Some copper models were of the many thin-finned and bonded together variety, others were mighty lumps of copper that looked like they were sand-cast in a 200-year-old Chinese foundry.

But that was still not enough to cope with ever increasing CPU temps, and more importantly, to serve the needs of overclockers running their processors far hotter than standard HSF's could cope with. Zalman was the first manufacturer to get seriously experimental, with its 'Flower'. Lovely thing to look at too. But it was only a marginal improvement, and was really designed to operate with a quieter fan in an effort to address the emerging issue of shrieking high-speed fans that were starting to get just a bit annoying.

Coolermaster has recently introduced the heat pipe concept to its heatsinks. This efficiently channels the hot spot closer to the top of the fins. It's hardly a new concept. Sony's PS2 uses a heat pipe and the basic concept goes back much further.

We've always liked funky HSFs, and following their design evolution has been satisfying indeed. But the engineering principles involved are simplistic. Only when needs are pressing are other, equally basic engineering solutions integrated.

Now with fast Pentium 4s running at 65-70 degrees, and Athlons not far behind, new solutions will be soon appearing. Water-cooling is a workable solution for the hottest CPUs, but the complexity of installing the water-cooling system puts off even the most seasoned modder. System integrators aren't keen on water-cooling, as one burst pipe and the warranty cost can run into thousands of dollars. Similarly, computer shops don't like selling water-cooling kits, as customers are inclined to press for compensation for their entire system, even if it's just the cooling system that's failed. Peltiers have always held promise, but they are equally scary, due to the condensation build up they inevitably produce.

On the immediate, practical front, there are brushless fans and YS TECH's Tip Driven Magnetic (TMD) fans, which place the electric magnets on the rim, thus reducing the size of the hub to a minimum and increasing the airflow to the center of the HSF — the 'hot spot'. We've also seen Xeon servers with a fully ducted heatsink and a fan at either end: one sucking, the other blowing.

What's cool is that sitting on top of the most complex of devices this species has created — the CPU — is a mechanism which employs the most basic science, and its development is moving, relatively, at the slowest pace. I'm confident there's a long list of solutions that will be implemented as needs arise.

There is much to love about computing, ironic then, that the most basic device warrants so much attention, but then, what else inside your box looks as cool?

Ben Mansill

atomic
MAXIMUM POWER COMPUTING

EDITORIAL
Editor: **Ben Mansill** bmansill@atomicmpc.com.au
Staff Writer: **John Gillooly** jgillooly@atomicmpc.com.au
Staff Writer: **Bennett Ring** bring@atomicmpc.com.au
Online Writer: **Brad Webb** bwebb@atomicmpc.com.au

DESIGN
Designer: **Kate Marsden** kmarsden@atomicmpc.com.au
Product Photography: **Michael Frey**

CONTRIBUTORS
John Simpson, Ronald Marc, Tim Dean, Dan Rutter, Des McNicholas, George Soropos, Ashton Mills, Ron Prouse, Stuart Torkington, Andrew Phillips, Chris Debruyne, Simon Peppercorn, Steve Polak, Lachlan Newman

PRODUCTION
Production Manager: **Angela McKinnon** amckinnon@atomicmpc.com.au
Sub-Editor: **Stuart Ridley** sridley@atomicmpc.com.au
Traffic Coordinator: **Jamie Dickson** jdickson@atomicmpc.com.au
Subscriptions: **Eileen Chong** echong@atomicmpc.com.au

Printed by AIW Printing. Distributed by:
Gordon & Gotch Australia (03) 9805 1650
Gordon & Gotch New Zealand (09) 625 3005

ADVERTISING
t + 61 2 8399 3346 f + 61 2 8399 3622
Strategic Accounts Head: **Andy Jackson** ajackson@atomicmpc.com.au
Senior Account Manager: **Cathy Snell** csnell@atomicmpc.com.au
Account Manager: **Joveline Bascon** jbascon@atomicmpc.com.au

AJB PUBLISHING
t + 61 2 8399 3611 f + 61 2 8399 3622
Unit 2–5/44–70 Rosehill Street, Redfern NSW 2016 Australia
Managing Director: **Adrian Jenkins** ajenkins@atomicmpc.com.au
Sales Director: **Simon Corbett** scorbett@atomicmpc.com.au

SUBSCRIPTION ENQUIRIES
t + 61 2 9879 4915

(ajb.publishing)

Atomic: Maximum Power Computing is published monthly by AJB Publishing Pty Ltd. Company registered in Australia (ABN 76 951 889 503). This publication may not be reproduced or transmitted in any form in whole or in part without the written permission of the publishers.

Liability: While every care has been taken in the preparation of this magazine, the publishers cannot be held responsible for the accuracy of the information herein, or any consequence arising from it. Please note that all review judgements have been made in the context of equipment available to Atomic at time of review.

Editorial and product submission: Atomic welcomes all information on new and upgraded products and services for possible editorial coverage. However, we respectfully point out that the magazine is not obliged to either review or return unsolicited products. The editor welcomes ideas for articles, preferably sent in outline form, with details of author's background and samples of previously published work. We cannot accept responsibility for unsolicited copy and stress that it may take time for a reply to be sent out.

April 2001- March 2002: 28,023

JB TSH32006-4

He's just sent a pile of spreadsheets flying.

OBSERVATION: When you leave the office to work, you leave behind many of the tools and resources you need to work with. Which means you can't leave the office if you want to get anything done. Crazy. Wireless technology can resolve this paradox, fast.
SUGGESTION: Investigate Toshiba's new e740 Pocket PC with integrated Bluetooth™. Add a Bluetooth-enabled data phone, and you can take a lot with you, do a lot with it, and once you've done it, send it on its way.

RESULT: You can carry gigabytes of data around in your e740's two card slots, and work on it with Pocket PC programs like Excel and Word. Job done? Attach your output to an email and send it to the world via your Bluetooth phone. Or use Explorer to access the internet, download data or documents, massage and manipulate them, and then send them where they belong. Goodbye office, hello cappuccino.

ACTION: For more information about wireless, talk to your Toshiba MobilePlus specialist reseller, visit www.unplugme.com.au or call 13 30 70 for a *Wireless for You* information kit.

TOSHIBA e740 Pocket PC: *Intel® PXA250 400MHz Xscale™ processor/integrated Bluetooth or Wi-Fi/SD and CFII slots/64MB RAM/long battery life/Microsoft® Pocket PC 2002 OS.*

TOSHIBA

Short Circuits

British engineers James Auger and Jimmy Loizeau recently unveiled a device they call the 'tooth phone'.

Installed into a human tooth, the tooth phone consists of a mini radio receiver capable of picking up digital radio signals, and a small vibrating device. When signal is detected it's transmitted via 'bone resonance' to your inner ear – enabling you to receive transmissions without anyone else knowing about it.

A perfect spy tool, the 'tooth phone' currently supports receive only. However, planning is underway to modify the device with a microchip that would allow transmission of signals to enable proper two-way communication.

Mobile computing has finally broken the 2GHz barrier with Intel shipping its Mobile Pentium 4 - M processor late last month. Laptops using the processor should be available by the time you read this.

Anti-virus company McAfee recently released a warning concerning a new virus apparently capable of infecting computers via JPEG images.

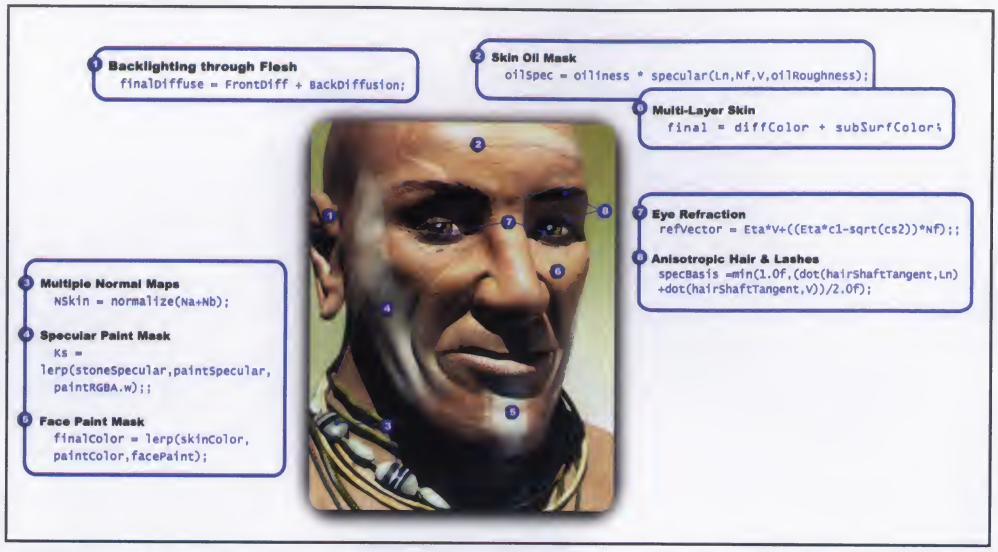
The virus, officially named W32/Perrun, distributes itself via JPEG image file and corrupts the image in the process.

Despite much posturing on the part of McAfee on how 'potentially no file type is safe' and that the industry 'may need to rethink JPEG distribution', rationality won the day.

Several Industry observers used common sense in pointing out that W32/Perrun's executable component needs to have infected a computer before the JPEG component could have any effect.

Without this pre-infection, JPEG files corrupted by the malicious code would be nothing more than corrupted images. In other words, they'd be harmless.

C for graphics



ABOVE: Some of the effects made comparatively easy with NVIDIA's Cg – however, we still think Assembly r0x!

NVIDIA recently unveiled the language it's dubbed Cg, otherwise known as C for graphics, to what seemed a largely positive response from the gaming industry.

Essentially a high-level language to provide GPU programmers with a layer of abstraction above current GPU programming methods, Cg does away with the laborious hand-coding of assembly currently required for graphics creation tasks such as pixel and vertex shading.

One of Cg's largest advantages is code portability. For example, shaders written in Cg will be compatible over multiple supported GPU hardware. Any DirectX 8 or OpenGL compatible GPU will be compatible at a basic level with the Cg code.

However, while NVIDIA claims support for hardware from other graphics chipset manufacturers, the company has publicly stated its Cg compiler will produce code optimised for NVIDIA hardware. Whether code produced for non-NVIDIA 'supported' hardware, such as chipsets produced by ATI and Matrox, will contain optimisation remains to be seen.

NVIDIA is making much of the wide industry support it's garnered for Cg, with proponents including Bioware, Bethesda Softworks, Industrial Light + Magic and Valve Entertainment. All are espousing the time Cg will save by allowing developers to write graphics code once and have it automatically converted by the compiler at run time.

NVIDIA has also garnered support from companies producing 3D rendering software such as Discreet (3D Studio Max), NewTek (Lightwave) and Alias|Wavefront (Maya) whose applications will gain initial support for Cg via plug-ins.

Ultimately, Cg's success will rely on its usefulness to developers. Regardless of whether the language produces optimised code for all, the main drawcard for developers will be the time Cg can save them when coding applications.

The Cg toolkit, which consists of a Cg compiler, Cg standard library, Cg runtime library, Cg user manual and the Cg Browser, will be available for download from NVIDIA's Website after July 13 2002. www.nvidia.com

i-Burst with anticipation

At a time when many are thoroughly cheesed at the broadband situation in Australia, Sydney based CKW Wireless is stepping in with what may just be a solution to our angst: high speed wireless Internet access.

Set to begin a Sydney trial in November this year, CKW's 'i-Burst' technology offers 'more than 1Mb/s per user and up to 40Mb/s in total, at any location.' The technology itself uses Time Division Duplexing, a technique which allowed CKW to save significant amounts of money when purchasing the slice of 3G spectrum needed to operate i-Burst.

Several large players in the industry, including OzEmail and Vodafone, have signed up to offer i-Burst-based products and a commercial rollout of the service is expected sometime in 2003. When it finally does become available, the only required equipment will be a small USB-based wireless modem. For more information, see i-Burst's homepage at www.arraycomm.com/internetproducts/what_is_iBURST.html

Mount Rainier – aka EasyWrite

After a tumultuous few years , Mt. Rainier is finally upon us.

By the time you read this, the first Mt. Rainier compatible drive will have been released: the Yamaha CRW-F1. A feature unique to the CRW-F1 (for now) is the capability to use unused space to write motifs, images or text to the CD surface itself. This will let you add your own personal signature to CDRs you create, or put a different picture on the surface of a CDR depending on what type of content it holds. Hmm. . . we can hear the prOn fiends rejoicing already.

One of Mt Rainier's major attractions is its speed. The CRW-F1 drive will write to CD-RW or CD-MRW (the new Mt Rainier CDRW spec) at 24x. That's 3.6MB/sec, or 3.5 minutes to burn a full CD.

While this speed is currently surpassed by non-Mt Rainier drives, keep in mind that this is a first generation example of the technology. As such, burning speeds of Mt. Rainier drives can only go up from here.

Unlike current CDRW drives, Mt Rainier drives are also capable of writing non-sequentially. This capability differs from that given by packet writing software for normal burners. Packet writing software writes sequentially, i.e. sectors 1 2 3 4 5 and so on.

Mt Rainier drives are capable of writing in any order – 5 2 9 3 7 – essentially making them sluggish versions of the hard drive.

For those of you wondering about compatibility, Mt Rainier is a totally open standard.

Created and endorsed by a body consisting of several different industry players, the Mt. Rainier standard should be readily taken up by hardware manufacturers – meaning CDRW software makers should be writing support for Mt Rainier as fast as they can.

In theory the next Windows operating system (Longhorn) will be able to write and re-write CD-MRW media without any third party software. Until then however, you'll be stuck with applications such as Easy CD Creator 5.2 that support it.

Before you start saving up the pennies to purchase a new Mt Rainier drive, try to remember how old your current CDRW burner is.

Most recent CDRW drives should be capable of Mt Rainier compliance with nothing more complicated than a firmware update. Older drives however. . . well, don't hold your breath.

Mt Rainier finally brings us to the point where the floppy drive is redundant. Intel has been making big pushes to dump legacy kit such as serial, parallel, and finally the floppy. It has been a good 17 years, floppy, but now it's really time to go.

The Driving force

Obsessing over drivers has become an art form for the performance enthusiast. The inherent need to have the latest drivers for your internal bits and pieces, has lead to some bizarre spin-offs, such as the explosion of Websites that host the latest leaked driver versions. When it comes to video drivers, NVIDIA is the shining light with its Detonator series of unified drivers.

One name that has never been comfortably associated with decent drivers is ATI. While it has improved tenfold since the release of the RADEON 8500 in both performance and stability, ATI has always had a confusing legacy when it comes to the wide range of applications that need to be installed alongside its base video driver.

This is set to change with the release of Catalyst, ATI's new unified driver set. It's a major step in the renewed commitment to driver development that ATI made soon after the release of the RADEON 8500. Catalyst is a single software package for the range of RADEON cards, incorporating the driver itself, an improved control panel, Hydravision 3.1, Remote Wonder software and a new diagnostic utility called Smartgart, which autoruns on installation and sets the AGP settings to the optimal level.

The new control panel brings ATI into line with the ease of functionality that is seen in NVIDIA's Detonator drivers. Graphics settings can be changed individually or via 'image quality' slider bars.

Normally such a release wouldn't make our news pages, but ATI has now emerged as a major contender on the back of ever-improving driver quality, and Catalyst marks a significant moment in this development curve. The future is certainly looking bright.

ATi CATALYST™

Short Circuits

ChessBrain is a distributed processing Web service coded entirely in XML and SOAP, aimed at creating a 'planetary chess computer using the processing power of interconnected machines throughout the Internet.' Essentially SETI for Chess, ChessBrain is not yet able to play a full game, however the project is progressing steadily and expected to be at Grand Master level within two years.
www.chessbrain.net

Russian President Vladimur Putin's personal Website went online late May after three months of security testing. According to several sources, President Putin's Website received over 100 attacks in its first 24 hours. A spokesperson for Russia's Federal Agency for Government Communications and Information then went on record saying President Putin's site was 'hacker proof'.

Such a claim cannot be made lightly, as it's sure to send attacks skyrocketing. However, Russian authorities are confident of the site's security. According to Netcraft however, Putin's Website was still running on an insecure version of the Apache Webserver at time of print. Oops.

Physicists at the Australian National University in Canberra have successfully teleported a laser beam between two locations in the laboratory.

Using a technique known as Quantum Entanglement, the beam's attributes were recorded and then transmitted to a second location. Once the data reached the new location it was used to recreate the beam.

Team leader Dr. Ping Koy predicted that using the technique of Quantum Entanglement, teleportation of a solitary atom would 'probably' be possible within the next three to five years.

Short Circuits

Scientists working at Princeton University in the United States may have invented a method for printing silicon that could revolutionise the computer industry and allow major processor manufacturers to replace current photolithography techniques.

Called Laser-Assisted Direct Imprint, the technique allows manufacturers to produce silicon faster than current processes and without the use of the toxic chemicals needed for photolithography.

The process revolves around an etched quartz plate which is placed over a silicon substrate. This is then bombarded with a laser to melt certain parts of the silicon substrate, which coalesce in a pattern conforming to the etched quartz.

According to the science journal *Nature*, LADI is capable of producing silicon at the 10nanometre scale, twice as small as the current photolithography limit of 20nm.

A new tool by the name of Refresh Lock is now available to fix your fresh rate gaming woes under Windows XP.

We're leaning towards it being a rebadged and reskinned HZ Tool – as evidenced by the small 'HZ' logo in the top left corner of the program window.

Regardless, Refresh Lock offers a quick and easy fix to 60MHz gaming hell for Windows XP users.

The humanoid hand from *Terminator* has become reality thanks to Japanese company Nitta Corp.

Incorporating five figures, more than 50 individual gears and numerous pressure sensors, Nitta's robotic hand is capable of operations as delicate as manipulating a paper cup.

Now, if only we can get hold of one to hook up to our self-aware Celeron 300A.

The mind boggles.

Palladium XP

When Microsoft announced it would focus on 'trustworthy computing', telling its programmers to stop work on new applications in favour of bug fixing old ones, many were cautiously supportive. After all, any effort at reducing bugs in software is a good thing. However, many questioned whether the company's official focus on secure programming would extend to future products. We now have an answer: it's called Palladium.

According to Mario Juarez, product manager for Palladium, the initiative 'involves a new breed of hardware and applications in tandem with a re-architecture of the Windows operating system. It's designed to give people greater security, personal privacy and system integrity.' Unfortunately for users, changes to Windows' source code aren't the only requirements for Palladium's success. Microsoft has secured support from AMD and Intel to produce special 'security' chips for integration into future hardware.

Apparently this chip will store cryptographical algorithms and keys – similar to the failed Clipper chip. Assumedly, these chips will be used for authentication and encryption, two features essential to Digital Rights management, which happens to tie in nicely with Microsoft's less emphasised goal: dictating to users what, when and how they view and use content on their PCs.

Whether Palladium's security will be implemented via a 'sandbox' feature for untrusted code – keeping said code separate from the system so malicious functions won't harm it – or is implemented by simply refusing to run any unsigned code, is yet to be seen. Also in question is who will designate what software packages are 'trusted' and what are not. Certainly this responsibility must fall to the user, otherwise Microsoft would be handed unprecedented powers over software developers the world over. While increasing security and reducing copyright infringement are worthy goals, the fact this system requires special hardware in the form of Microsoft's 'security chip' makes it a dubious prospect. Many industry observers have begun to espouse what they see as fatal flaws and drawbacks in the system, including the potential death of Open Source and the General Public License at the hands of an 'un-trusted' designation. It remains to be seen whether Palladium is what Microsoft claims. Is it a system for increasing security and privacy? Or does it hold true to its www.dictionary.com definition?

Atomican

Good evening and welcome to Channel Atomican News.

I'm your host Wilkshake, keeping you up to date with the latest in Atomic community events and happenings, with as little logorrhea as possible.

Another up and coming dot com business was started this month.

Sun Microsystems (www.atomicmpc.com.au/forum.asp?cat=ge&top=54227) hopes to be one of the market leaders in providing systems and software with the scalability and reliability needed to drive the electronic marketplace.

Industry analysts predict that the company won't last more than six to eight months.

Speculation is rising in the community as to when 'The Cow' will get replaced.

Thus far, 'Stickman', 'Balaclava' and 'Grumpy Dude' have all seen in change, with varying degrees of success, but 'The Cow' has remained steadfast in its position of solidarity.

While this reporter is not saying that 'The Cow' is bad, inappropriate, stupid or misrepresenting anything, there comes a time in a cow's life to be updated to keep with the times, and not seem stagnant.

Now it's over to Wilkshake for the weather.

Thanks Wilkshake.

This month will unfortunately see continued occurrences of SQL timeouts, database errors, and double posts.

This is due to the continued popularity front currently passing through Serfdom, and quickly making its way up to Immortalville. However, we have been informed by the BOAS (Bureau of Atomic Servers) (www.atomicmpc.com.au/forum.asp?cat=ge&top=54284) that plans for both a new server and forum code have been put into action.

This will allow the popularity front to continue, but also allow for the certainty of the front growing, spreading and enveloping all in its path. And that's the weather.

Back to you Wilkshake.

Good Job with that weather Wilkshake. And that's the news to this minute.

Stay tuned to the forums for further updates, with our next bulletin in Atomic #20. This is Wilkshake reporting, and remember. . .

There are 10 types of people: those who understand binary, and those that don't.

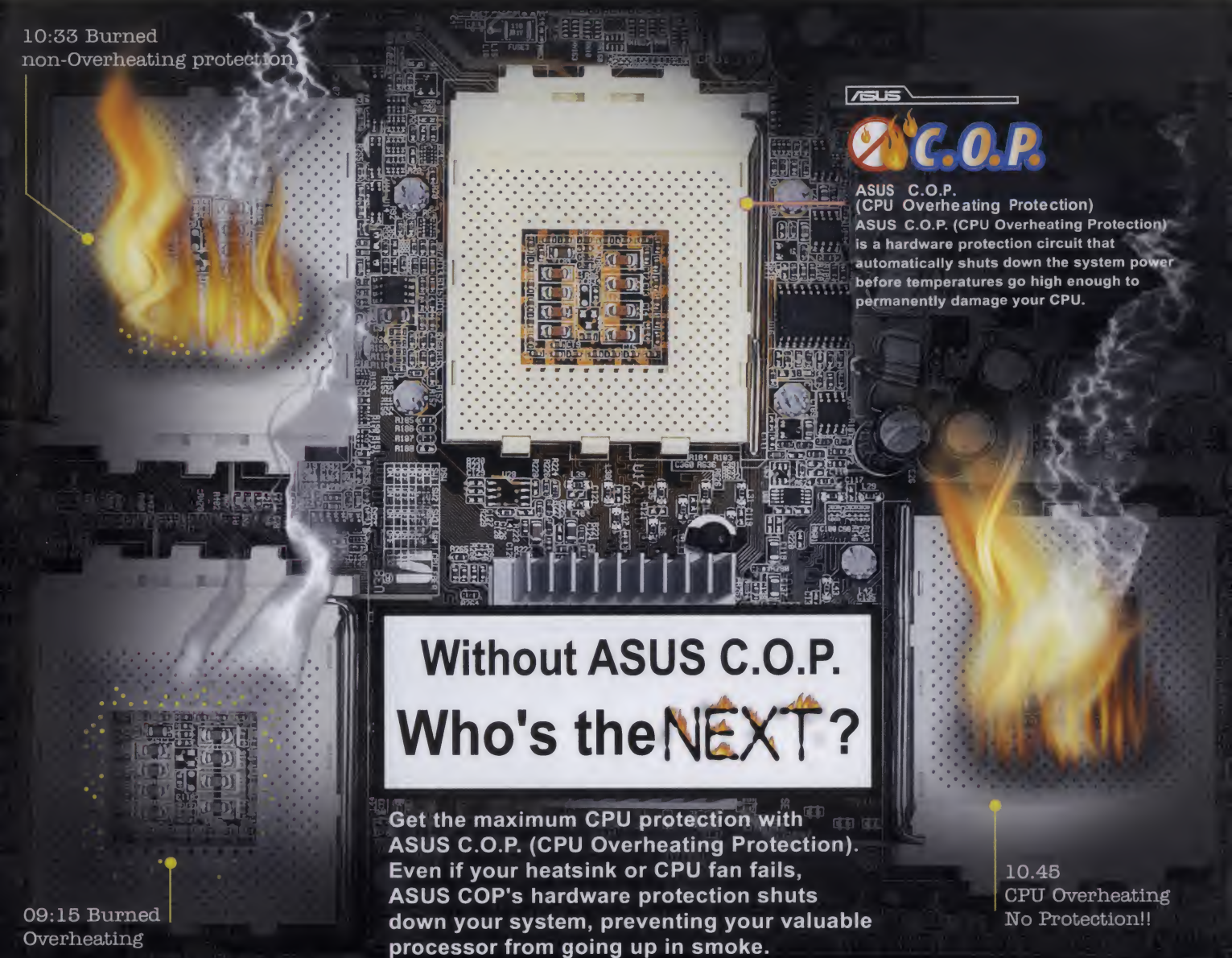
WHAT'S HOT

- SERIAL ATA – Looking to the future at last
- NEVERWINTER NIGHTS – RPG Nirvana
- I845E – Cheaper and faster
- FIGHTER JETS – Very *Atomic*
- PAINTBALL – IRL Deathmatching

WHAT'S NOT

- BREAKFAST CEREAL – Laden with legacy
- DUNGEON SIEGE – RPG Lite
- I845G – Integrated Crap-hics
- INKJETS – Very *Weekend Newspaper*
- HANDBALL – IRL playlunching

Designed for eXtreme Performance



Get the maximum CPU protection with ASUS C.O.P. (CPU Overheating Protection). Even if your heatsink or CPU fan fails, ASUS COP's hardware protection shuts down your system, preventing your valuable processor from going up in smoke.

ASUS C.O.P. Just another innovative feature from the world's leading motherboard maker.

ASUS

A7V333

A7V333 Specification:

- Socket A for AMD Athlon XP/ Athlon/ Duron 600MHz ~ 2GHz+
- VIA KT333 N.B. with 8233A S.B. Supports 266/200MHz FSB
- 3 x DDR DIMM Support Max. 3GB PC2700/2100/1600 DDR SDRAM
- 5 x PCI, 1 x AGP Pro
- C-Media 6-Channel Hardware Audio with S/PDIF Support (Optional)
- Promise ATA133 RAID 0, 1 (Optional)
- 4 x ATA133 (RAID ATA133 is optional)
- ASUS CPU Overheating Protection (C.O.P.) Support
- ASUS POST Reporter[a] , ASUS MyLogo[a]
- Smart Card/Memory Stick/Secure Digital (Optional)
- 4 x USB2.0, 4 x USB1.1, 1 x IEEE 1394 (Optional)
- ATX Form Factor

ASUS C.O.P. (CPU Overheating Protection) · ASUS POST Reporter[a] · ASUS Q-FAN[a] · ASUS MyLogo[a] · RAID ATA133 · DDR 333 · 6-Channe Hardware Audio · S/PDIF · USB 2.0 Ready

National Headquarters
1/14 Hi-Tech Drive, Kunda Park, QLD 4556
Phone (07) 5445 2992 Fax (07) 5445 2069

cassaaustralia

Melbourne Sales Office
Level 1, 329 Mitcham Road, Mitcham, VIC 3132
Phone (03) 9874 3411 Fax (03) 9873 0500

Learn more at www.cassa.com.au or call 1300 365 047

Jinxed

The evolutionary technology wave folds in upon itself, and Ashton Mills gets caught in the pounding surf.

This must be the year of Ashton's Hardware Follies. First there was my RAID escapade, then the BIOS Incident (which I haven't shared with you, but might if you can catch me on #atomicmpc sometime while I'm suitably bereft of my senses) and now this, an event for which I have coined a new term: the f*#k-it factor.

This is, by definition, the limit by which your willingness to participate in any given endeavour has been reached to the extent that you are pissed enough to throw up your arms in exasperation and shout 'I've had enough! F*#k it!'

Ultimately all things to which you can apply your mind and body have an FIF. Every situation is different, as is the determination of each individual. It's interesting to note that, specifically in the realm of computers, there is an entire industry built around the f*#k-it factor – it's called Tech Support. Users, in a desperate attempt to avoid the FIF, ring up someone whose job it is to take on the user's problem and solve it before they, themselves, reach the FIF of their relationship to said user on the phone. For particularly stupid people, tech support personnel find themselves reaching this limit rapidly. It's a funny game. Ultimately, people pay good money to avoid reaching the f*#k-it factor in their own lives because, frankly, it sucks.

But I digress. There is a timeframe that can be placed on a problem before it reaches the FIF. For me, this was two weeks.

Two weeks. Solid.

It all started when my brand new uber-elite-PC-of-the-gods upgrade arrived in its many parts.

I was upgrading everything but the video card (LeadTek GF3 TDH), the Lian Li case, and faithful 19" Sony Multiscan 400PS. I locked myself away in my room with an Abit AT7, Athlon XP 2100+, 512MB Corsair XMS3200, Creative Audigy, and two IBM 120GXP 7200RPM waiting for the sexiness of RAID. I marked off my supply list: Coke (check!), cheese sandwich (mmm. . .), loads of dark chocolate (tick!), warm socks (roger!) and take away menu with phone (yum). I boarded up my room, left a Post-It note on my door that depicted images of death for all who would enter, and got to work.

Building the box went fine and, when I excitedly pressed the power button, the lights dimmed briefly as my beast hummed into life. I could all but smell the envy of my friends.

'In ten years of building PCs I have never encountered anything like this. And I paid good money for the experience.'

But unbeknownst to me, all was not well with my baby.

It was while benchmarking (as you do) that major problems started to arise, specifically the blue screen kind. My baby was suffering CTDs and BSODs in both 3D and 2D, seemingly at random.

More than this, the Audigy's output was punctuated by so much crackling and popping it could be mistaken for a popcorn machine. Then there was a drop in RAID performance that resulted in low scores even after application of the George Breeze patch. And this was all before I even got around to overclocking, so heat most certainly wasn't a problem.

Suffice to say, I wasn't impressed.

Thus began two weeks of driver swapping, hardware interchanging, and BIOS tweaking – including playing with memory settings, PCI latencies, and AGP values. I even flashed the BIOSes on the mobo and GF3. Nothing seemed to work. This was new hardware running in spec, so what on Earth was going on?

Out of despair while working on the Audigy problem, I moved it from PCI 3 (the only slot not sharing an IRQ, naturally) to PCI 1. Bingo, sound problems solved (cue dumbfounded blinking). Was the Audigy to blame here, the AT7, or VIA? Was it unreasonable for me to expect a PCI slot to work as it should?

In another strange twist of events, when I upgraded the NVIDIA drivers to the latest WHQL release, my RAID performance jumped up 20MB/s to the values I was expecting originally.

Uhuh. Don't ask, let's just be thankful and not disturb whatever ethereal forces are at work here.

Which just left the BSOD problem. Taking a closer look at the error all was revealed: my baby was suffering the infamous NVIDIA infinite loop error, a special treat reserved for Windows XP systems with GeForce cards on VIA and Intel based platforms. Thusly my PC had joined the many thousands of others online which suffer the problem.

No matter what I tweaked – not even underclocking to a 100MHz FSB to ensure stability – nothing worked. With a 420w Topower Gold PSU, it wasn't a power issue either.

And so it was, my friends, that I reached the f*#k-it factor.

The system was a litany of obscure problems right from the get-go. In ten years of building PCs I have never encountered anything like this. And I paid good money for the experience. It seems that with the ever-increasing turnover of technology that some spheres are starting to cave in on themselves. Whatever happened to the idea of QA testing?

The infinite loop error is widely reported, but there have been no sure fire solutions. Even the extensive list provided on www.viaarena.com is mostly snake oil. The problem may well be a combination of factors, but one truth remains: it is unacceptable to sell faulty solutions, and somewhere along the line one or more of NVIDIA, Microsoft, VIA and Intel is at cause. Something needs to be done.

In the meantime I will persevere, and I will succeed. For I am Atomic!

SONY

Sony optical technologies. A vision for the future.

RW DVD+ReWritable Sony's range of state-of-the-art optical burners are ready to work for you now and into the future. As the company who developed the CD-ROM format and brought CD-R to market, we remain a worldwide leader in componentry and drive technology. Here in Australia our superior quality and reliability has been recognised with our CD-RW products achieving #1 market position*. We now bring the same expertise and success to Recordable DVD.

Power-Burn™ Developed by Sony, this technology ensures high fidelity recording and consistent maximum performance. While preventing buffer-under-run, PowerBurn™ optimises the drive operation to make the best use of the PC, media and environmental conditions.

i iLink, also known as IEEE1394, is a high speed interface specifically designed for handling time-sensitive data. Found in most high quality video cameras and some audio equipment, it is also supported by many of our quality optical storage products. For those who would prefer a more inexpensive plug-n-play interface, we also offer USB.

MEMORY STICK Imagine a storage medium that fits in your wallet and holds up to 128MB of data, audio, still images or video. Imagine taking pictures from your camera and copying to CD with simple PC software. Imagine having two drives in one: a high speed burner/player plus a digital media reader/writer. Memory Stick makes it all possible.

Share around the office
External models are designed for the office environment or laptop. They're sleek, sturdy, operate both vertically or horizontally, and are compatible with either iLINK interface or USB2.0.

Additional DVD playback
Portable models are ultra-light, yet high in performance. Offering full burner facilities, they play back both CDs and DVDs. They ship with either PCMCIA or USB interface compatability.

Support for up to 48X
Internal models are designed for easy installation into desktop or tower PCs. Drives feature performance optics, fast audio extraction and the latest buffering technologies combined with convenient IDE interfacing.

For more information on the Sony range of optical burners
call 1300 13 SONY (7669) or visit www.sony.com.au

*Source: IT Market Insights Feb '02

FNL SNY1021/AT

Nylon sandwich

A teaspoon of tin/lead, three tablespoons of solder, six slices of copper, three wedges of polyamide, garnish with ammoniated etcher. Tim Dean serves lunch.

Nylon. Is there anything it can't do? I can't think of anything. Just last week, as I strolled across my nylon-tiled floor in my nylon shoes, wearing my nylon pants, sipping Nylon-brand ice tea from my nylon cup, I got to thinking.

About PCBs. The mighty printed circuit boards.

It really must have been a heady time back in 1958: NASA was founded; *Green Lantern* and *Aquaman* comics are breaking new ground; Alfred Hubbard sets up the first clinic to use LSD for therapeutic purposes just as the Palo Alto Mental Research Institute begins its own studies into the wacky chemical; the Argonne Low Power Nuclear Reactor reaches criticality; the inaugural issue of *The Australian Gemmologist* is published; a 524-metre-high wave is clocked travelling at 160km/h in Lituya Bay, Alaska; and two people individually come up with the concept of the integrated circuit (IC): Jack Kilby at Texas Instruments, and Robert Noyce.

Those were the days (and how about that wave?! You can see why they used such bloody big surfboards back then).

The big thing about the integrated circuit is that it enabled electronic devices to be made much smaller than anything else available at the time. Before the IC, individual components had to be joined by wires that were soldered at each end.

By the end of the 1950s they were already reaching the limits of practical soldering of very small wires, and this was imposing a hard limit on how small electronic devices could get.

For example, the McDonnell Douglas F-4D Phantom II had the AN/APQ-109 partially-solid state radar in its nose, and this was so big and heavy, that nothing else could fit in there, whereas when they moved to the AN/APQ-120 fully-solid state radar into the F-4E in 1966 they could also include the much-needed M61 Vulcan Gatling gun and over 1,000 rounds of 20mm ammunition to boot (guess what books I used to read as a kid. . .).

The big thing with ICs is that instead of using wires, the traces that connect the components together are built into the substrate (the material holding it all together) itself.

Thus we soon had the printed circuit board, and (not so) soon after that, we have multi-layer boards sporting hundreds of individual components and thousands of traces, and a GeForce4 or a VT8367 Northbridge chip in the middle of them all.

'. . .besides being in the stockings on your legs (come on, don't be afraid to admit it), there is nylon at the centre of many of the PCBs in your PC.'

Right about now, you're probably wondering where nylon fits into all this. Well, true to form, nylon pops up in the strangest of places. In fact, besides being in the stockings on your legs (come on, don't be afraid to admit it), there is nylon at the centre of many of the PCBs in your PC. This stuff goes by the funky name of polyamide laminate and acts as a dielectric – or in normal language: the nylon is an insulator.

Nylon is not the only material used in the manufacturing of PCBs. There's also fibreglass, Teflon (only in single-layer boards), Kevlar (which is basically a form of nylon, or at least an aramid), Kapton, and many other insulating polymers – but nylon is the coolest. The core is then wrapped in a conductive metal – usually copper – and then the fun begins.

The sandwich is then coated in a substance called photoresist – called this because it is sensitive to UV light, but resists the chemicals used for etching in the next steps. A pattern, called artwork (and art it is), is then laid over the plate. This artwork covers the areas that will eventually become traces. The plate is then exposed to light, and the photoresist in the areas not covered by the pattern is removed. Hardcore ammoniated chemicals then etch away the uncovered copper, just leaving the traces and the insulator at the centre.

Then the plate is sandwiched again, this time between prepreg, which is basically the same insulating material as the core, and acts as a glue for bonding multiple layers together.

Multiple layers are good as they allow a great deal more complexity than just a single layer – because on a single layer, no two traces can cross over each other. With just one more layer, you can have traces run between levels, allowing a far more efficient design.

Talking about design, much of the layout of modern PCBs is done through specialised software. This is mainly because you would need a brain the size of Texas to be able to take into account all the different parameters of each component, and then optimise their positions so as to give the shortest possible routes between them without using dozens of layers – which can get very expensive. This is also the reason that some boards are more expensive or perform slightly better than others.

The designs on these boards are very likely better optimised, and as such there will be less cross-talk and RF interference between traces, and the components can communicate more efficiently.

As a final note, the colour of a PCB has nothing to do with the materials of the board itself. The colour comes from the solder mask, which is applied over the naked board to protect the board and stop solder from bridging gaps and shorting traces. This solder mask can be just about any colour, as we have seen in recent months from companies such as AOpen, MSI, Hercules and TripleX.

So there you go.

Hats off to nylon. The mighty material with a million uses, and used in a million motherboards.

MSI

845GIVEME533

PC2PC Bluetooth

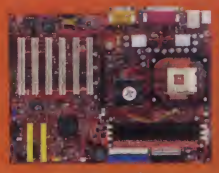
DDR

Intel LAN

6Channel

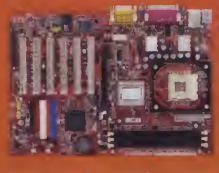
USB 2.0

845E Max2-BLR
Intel® 845E chipset Socket 478 ATX



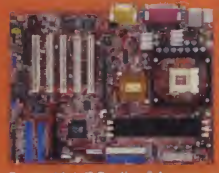
- Support Intel® Pentium® 4 processor up to 2.4GHz
- FSB: 400 MHz clock and higher
- USB2.0 Technology
- 3 DIMMs, up to 2GB of DDR 266(PC2100) Memory supported
- LAN on board- Intel® 82562ET (Optional)
- Hardware monitoring function
- Suspend to RAM / Disk function
- AC'97 6-channel audio S-Bracket is supported
- 6 PCI/1CNR/1AGP
- PC2PC- Bluetooth(Optional) / S-Bracket / MSIDVD 5.1Ch / Live Driver™ / Live BIOS™ / Fuzzy Logic™ 3 / D-Bracket™

845G Max-L
Intel® 845G chipset Socket 478 ATX



- Support Intel® Pentium® 4 processor to 2.4GHz
- FSB: 400 MHz clock and higher
- USB 2.0 Technology
- 3 DIMMs, up to 2GB of DDR 266(PC2100) Memory supported
- LAN on board- Intel® 82562ET (Optional)
- Hardware monitoring function
- Suspend to RAM / Disk function
- Integrated 3D/2D graphic core on GMCH chipset
- AC'97 audio
- 6 PCI/1CNR/1AGP
- Live Driver™ / Live BIOS™ / Fuzzy Logic™ 3 / D-Bracket™

645E Max2-LRU
SiS® 645DX Socket 478 ATX DDR333



- Support Intel® Pentium® 4 processor to 2.4 GHz
- FSB:400/533 MHz clock
- ATA 133 RAID 0, 1, 0+1
- USB 2.0 Technology
- 3 DIMMs, up to 3GB of DDR 266(PC2100) and DDR 333 (PC2700) Memory supported
- LAN on board- RealTek® RTL8101L
- Modem Riser(Optional)
- AC'97 6-channel audio
- 5 PCI/1CNR/1AGP
- S-Bracket(Optional) / D-Bracket™ / Live BIOS™ / Live Driver™ / Fuzzy logic™ 3

G4MX4600-VT
SiS® 645DX Socket 478 ATX DDR333

- nVIDIA® nfiniteFX™ II - Featuring Dual programmable Vertex Shaders and Advanced programmable Pixel Shader - enables a virtually infinite number of special effects.
- nVIDIA® nView™ - Displayt echnology provides the ultimate display flexibility and user-friendly control.
- nVIDIA® Accuview Antialiasing™ - Delivers unbeatable visual quality and frame rate.
- NVIDIA® 4th Generation GPU - GeForce4™ Titanium series
- NVIDIA® nfiniteFX™ II Engine
- Dual Programmable Vertex Shaders
- Advanced Programmable Pixel Shader
- 3D Textures & Shadow Buffers
- Z-Correct Bump Mapping
- Accuview Antialiasing™ Subsystem
- nView™ Display Technology

For more information visit our website www.msicomputer.com.au

Also Technology
NSW/ACT Tel (02) 9519 4600
VIC/TAS Tel (03) 9560 3388
QLD/NT Tel (07) 3357 4300

Ingram Micro Australia
Tel 1300 65 3333
Fax 03 9545 3326

Leader Computers
SA Tel (08) 8112 6000

Legend Performance Technology
NSW Tel (02) 9662 2811
QLD Tel (08) 8401 9888
WA Tel (08) 9389 4422
VIC Tel (03) 9281 3750

MSI™
Link to the Future

All Functions above are for all of MSI products. MSI™ is a trademark of Micro Star Int'l Co Ltd. Specifications are subject to change without notice. All brand names are trademarks of their respective owners. Any configuration other than original product specification is not guaranteed.

Max head room

What will it take to transfer our lives into *The Matrix*? Daniel Rutter just wants some good head gear.

OK, forget the flying cars. I just want proper VR.

I never particularly dug Diablo and Diablo 2, because I've played NetHack and ADOM and Angband, baby – and I want one of those games in full VR, with user-assignable gestures to cast common spells.

I want a god game in which I can point to shoot lightning, pinch to pick up a peasant, and grab to reshape the whole landscape.

I want an RTS that lets me just look around the battlefield, not scroll or click on a mini-map, and I want it to automatically highlight the battle group I'm currently looking at and apply my commands to it.

'. . .for the benefit of this magazine's readership that wasn't born when *Neuromancer* was first published, it's like in *The Matrix*, kids.'

Unfortunately, virtual reality isn't a very popular concept at the moment.

Oh, sure, there are plenty of researchers plugging away at it, and various futurists pontificating about it. But I can't help but notice that I still can't 'jack in'.

Jacking in is a concept popularised by William Gibson – he envisaged people connecting to cyberspace via a direct cable link to the brain – and, for the benefit of this magazine's readership that wasn't born when *Neuromancer* was first published, it's like in *The Matrix*, kids. Like that.

The problem with this idea is that, barring some very surprising breakthroughs in, um. . . a whole lot of scientific fields, it isn't going to be happening soon.

Happily, though, that doesn't mean that we're not going to be able to play with, um. . . I mean greatly increase worker productivity and shareholder value by proactively utilising. . . some pretty darn compelling virtual reality in the quite near future.

And we need exactly one piece of hardware to make it happen.

Never mind fantasies about bodysuits that let you directly control your in-game avatar, and magic Holodeck-ish rooms that somehow stop you headbutting the walls as you move around – consider, instead, just a good high resolution wide angle head-tracking Head Mounted Display (HMD).

No bulkier than one of Elton John's middleweight pairs of glasses. No more expensive than a top-flight video card. You could use it with a sit-down control rig, not much different from the controllers we use today.

This display is the key technology. Everything else is easy.

Graphics cards with dual monitor outputs are already becoming mainstream items. Hardware that can drive two-eye displays, and which can come built into game consoles as well as on PC video cards, won't be much of a leap.

CPU power is forging ahead, too. VR applications aren't from the CPU's point of view qualitatively different from normal 3D programs – sure, you're going to have to render more stuff, but that's possible.

So none of that is a particularly huge hurdle. It's the display that we've got to get working.

An apparent wide screen television hanging in the air five feet in front of your face is pretty cool, but the normal visible world is rather larger, and it doesn't turn with you, so head tracking is a must.

Thus far, not many HMDs have motion tracking, because you don't *want* it, for many applications. If you're using an HMD for virtual screen applications – heads-up info, watching movies, espionage gadgets like Arnold and Arnold used in *True Lies* – then you probably want the screen to stay in front of your face at all times, and head tracking is useless.

HMDs also don't have a really wide view which stretches out into the peripheral vision area. Again, this is because it's a pointless feature if you want to display a normal screen image. People can't read with their peripheral vision, and stretching movies out that much makes the whole image very fuzzy, because you don't have enough pixels in the first place. Fuzziness doesn't matter in peripheral vision, but it does matter when it's in the little sharp macular vision spot in the middle of your view.

For convincing VR you need head tracking and wide view. Head tracking is a bit tricky, but not horribly expensive to implement, especially if the user has the decency to sit in a chair and not prance around the room. And wide vision can be done without monster resolution if you use clever optics fed by an appropriately pre-distorted rendered image. The original image, viewed without the optics, will seem to bulge in the middle, because that's where the high-res section is rendered. The optics flatten out the bulge, and match the image resolution in each area of the picture to the visual resolution of the part of the retina that's seeing it. Presto: you're not wasting power rendering zillions of pixels that the user can't clearly see.

Eye tracking tech would let you put the high-res spot wherever the user looks; or more cheaply, the spot could just be fixed in the middle of the display, and users would have to learn to turn their heads, not move their eyes.

Brute-forcing wide vision by creating a 10,000 by 10,000 pixel image that's sharp all over would do, too, but there'll have to be a revolution in tiny video display technology for that to be an affordable solution. Wearable displays, based on little panels and more exotic tech such as laser retinal scanning, *are* forging ahead. And it's about time, as anybody who's peered at a weeny WAP phone screen will tell you.

So I'm hopeful that sometime soon I will be able to pop on a jet-black set of Buddy Holly shades, look down, and see Conan's pectorals.

Or Red Sonja's.

(I'm a broadminded guy.)

MORE SPACE

Custom Made by
COMPUCON
FLEX-UP™
FLEXIBLE
EXPANDABLE
UPGRADEABLE

intel inside
pentium 4

APOLLO iPOWER PC

The Compucon Apollo iPower PC with the top performance Intel® Pentium® 4 Processor, gives you the power to grow your business — and expand your PC further with extra drives, cards, fans, etc. — so you won't need a new PC when your sales skyrocket.

Sydney	(02) 9417 7166	**Brisbane**	(07) 3856 0999
Melbourne	(03) 9870 5567	**Perth**	(08) 9244 3400
Adelaide	(08) 8238 9000	**Auckland**	(09) 415 3303

Vancouver • Hong Kong • Beijing • Chengdu • Nanjing • Shanghai • Shenzhen

www.compucon.com

COMPUCON
Quality Made for You

Intel, the Intel Inside logo and Pentium are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries.

WIN WITH COMPUCON

Vote for this month's hottest Hot Box at www.atomicmpc.com.au (closes 21/08/02)

Xochi's Box O' w00t

Technical details

- Pentium III 800MHz
- 1972 original cabinet
- 17" monitor screen
- 3GB HDD
- MS DOS 6.22
- MAME and ArcadeOS software
- Too many MAME ROMs
- Mosaic of game artwork
- Functional coin slot
- Hacked keyboard
- Cheap-arse speakers
- Trackpad mouse
- Two USB modded Dual-shock controllers

The Story

I have modified an original 1972 cocktail cabinet to hold a P3 800 MHz computer. The entire cabinet was disassembled, sanded, stained and varnished. The original interior metal brackets were customized to accept a 17" monitor stripped of its case, and is bolted in place. The motherboard with onboard video and sound is attached to a tray, and is held in place with magnets, for easy servicing. A 3GB HDD holds a stripped down version of DOS and ArcadeOS for instant booting, and way too many ROMS :)

Most of the buttons are multiplexed, so all the main features of MAME can be accessed with just six buttons – not a single extra hole was drilled into the original arcade cabinet. The coin mechanism was stripped, cleaned up, wired in, and now operates functionally. A big bowl of 20 cent coins live on top of the MAME cabinet.

The Darrkon Box MKII

Technical details

- ABIT KR7A
- Athlon XP 1800
- Dual 19" flat CRT monitors
- ASUS V7700 GeForce 2 GTS
- TNT2 M64 32MB (secondary)
- SoundBlaster Live! DE 5.1
- Kingston 256MB PC2100 2-2-2
- 60GB 7200RPM WD IDE HDD
- 113GB 7200RPM WD IDE HD
- 350w PSU
- Four 120mm fans
- Three 80mm fans
- Black contact coating
- Blue neons

The Story

First off, big thanks to HCB. Without his talk of case mods and AMD rulez, I would still be using the previous Darrkon Box.

I sunk a bunch of money into the hardware above and wound up with a very nice system that runs SETI damn fast. But this was not enough, and so the monster intakes were born. Starting at the top, I constructed a wooden, triangular housing that would be used to hold two x 80mm fans that suck air out from a hole where previously two x 60mm fans had lived. This was indeed good, but not great.

I found120mm Delta fans (used) for less then $10 each at the local markets, and after feeling a ripple in the force, I knew that these fans MUST become a part of the Darrkon Box. I cut mighty (rough) holes in the sides and motherboard tray, then built the huge wooden shrouds to house the 120mm fans and pointed them to blow air into the case. The net result is massive airflow over the disks, cards and CPU, as well as splattered remains of anything that gets too close.

WIN WITH COMPUCON

Vote for this month's hottest Hot Box at www.atomicmpc.com.au (closes 21/08/02)

Picky's Lamez box

Technical details

- AMD Athlon XP 1800+
- Epox 8KHA+
- 512MB DDR RAM
- ASUS 7100 Deluxe Combo – Geforce 2 MX 400 w/32MB DDR RAM
- Lite-On 24x12x40 Raw-DAO
- Lite-On 16x DVD
- 40GB Seagate Barracuda 7200
- 10/100 LAN Card
- 19" Hitachi CM721F
- Optical Mouse
- 28cm Perspex window + UV Cold Cathode light

The Story

After seeing 16+ issues of hot boxes I decided that I had to do one. A bit of drawing and colour matching, then it was down to Mitre 10 to get spray paint. Upon arriving at checkout with my stuff, I was 'informed' that I had to be over the age of 18, so back the next day with my Mum. I taped up the sides with masking tape – anyone looking at doing a case mod should buy at least three rolls, because I still haven't figured out where it all went. Each side had about four or five layers of paint, and then the writing was gone over with a 'phat' permanent marker. Once my window and UV light had arrived I started taking the hole out with a hammer and nail. The inside was painted white in hope that it would glow under UV light – it didn't, so I drained three yellow highlighters of their fluid and soaked two tissues in it, and strategically placed it under the UV light for a green glow.

The Travis box

Technical details

- AMD Athlon 1.2GHz
- ASUS A7V 133
- 512MB Hyundai PC133 SDRAM
- 80GB Seagate BaracudaIV
- 16x2 backlit LCD
- ASUS GeForce2 GTS modded to Quadro2 Pro
- SoundBlaster Live! Value
- REALmagic DVD decoder
- PixelView TV Tuner
- Netgear FA311 NIC
- Rounded IDE cables
- 12" red neons
- 80mm front intake fan

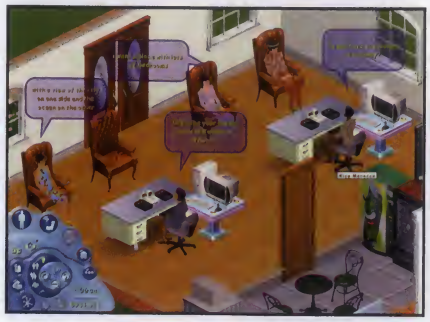
The Story

After being turned on by some really neat cases, I decided to try modding for myself. My main aim was to keep the costs of the whole project to a minimum, but still have a decent case in the end.

The paint job was the hardest and most time consuming, with lots of sanding and many coats involved trying to get close to a mirror finish as possible. In total, six cans of black and two cans of clear paint where used, with individual parts like the fan grill and buttons being painted with red model paint. After the final coat, the case was buffed with some car polish.

The 16x2 LCD was easily hooked up: it was simply interfaced to the parallel port using wiring diagrams found on the Net. I use the LCD mainly to show Winamp song titles. Red rounded IDE cables, two red 12" neons and the front 80mm intake fan were then installed. Bright LEDs also replaced the default HDD and power on LEDs. Finally, a piece of mirror was cut for the bottom of the case.

The Sims Online



Online gaming is supposedly the great future for all videogames, however it has also been somewhere only the hardcore come to play. EA is hoping to fix this with its latest iteration of the popular Sims saga. The Sims Online isn't the most hi-tech effort: visually the game uses the same fairly tired looking approach as the original Sims. The interface hasn't changed much either: you give your sims directions, buy stuff for their abode and monitor their well being.

However, as the name so craftily implies, you now do all of this in a massively multiplayer environment. You also have a reason for being in the game because you are set financial or other as-yet-undetermined personal goals: you have to make a buck, make friends or build up your home or place of work. Work is another element of the game that changes with the transition to online play. Now you have a job, and have to work at it to be a success and make cash from your online buddies.

Jenna Chalmers from Maxis demonstrated the game and showed off one of the professions at the recent E3 Expo. Exuding personality, as most game developers do, she chose to be a gameshow host. She then set up a studio and invited players to pay the entry fee and compete in her quiz. Once the contestants paid their entry amount (which is how Jenna earned her living) they then played for points which eventually would see one winner who walked off with a cash prize. It looked very bizarre, but it might also just work.

As you'd expect, the 'sim speak' Swedish Chef chatter has been replaced with instant messaging text in speech bubbles. This is how you will talk to other players online. ICQ addicts beware!

The interface is otherwise similar to the other games in the Sims series. The only difference is that you can now explore an entire town and a range of new location types.

No doubt not long after the game's release we'll also see marriages, scams and players' avatars making total quinces out of themselves. It should be an interesting social experiment.

EA is launching the game in around a year and planning to support 50,000 registered players online.

GAME DETAILS

WHY WE CARE: **Online weddings, drunken parties and strange occult ceremonies.**
DEVELOPER: **Maxis** www.maxis.com
PUBLISHER: **EA** www.ea.com
PLATFORM: **PC** **DATE:** **2nd Qrt 2003**

Civilization III: Play The World

Put simply Civ III is the best strategy game out there: it immediately sucked up our spare time like a Hoover with a turbocharger fitted. That said, despite Civ III's brilliance, the game needed a lot of patching and was terribly buggy.

In Civ III: Play The World, you can play your mates via email, in a hot seat mode or using a LAN/online approach. There will even be different options for online play with turn-based and simultaneous play approaches part of the package. Firaxis has also tried to solve the issue of games dragging on for millennia by coming up with some modes of play that will make for lightning fast games. Elimination and Regicide games will be quick and decisive, as you'll only have to destroy an enemy city or leader to win.

More toys have been added with new civilisations such as the Mongols, and there are 24 new units that are spread throughout the various Civilisations. There will also be new terrain maps, and more significantly, new structures which should redress some of the imbalances in the gameplay. To help make it easier to use aircraft in both defensive and offensive situations you will be able to build airfields rather than having to go the expensive route of founding a city when all you want to do is bomb your enemies senseless.

Similarly, if you want to cheaply extend or stabilise your borders you will now be able to set up outposts which will maintain borders even if they won't be able to fulfil the 'border push' function by adding to your culture score and expanding your mighty empire.

Play The World will also feature two completely new unit tile sets: Japan and World War II, and these should add variety to the visuals.

Finally, in a most welcome move for us hard core Civ fans, the interface will be seriously tweaked. You will now be able to send units travelling in convoys, locked at the speed of the slowest unit (hooray!). With the click of one button you'll also be able to immediately recognise cities in desperate need of your attention because they are suffering from civil disorder. This might not sound like a big deal, but it is hugely welcome for anyone who has played a game with 60 or more cities while having to regularly scan all of an empire for the one city having a ruck. Although the formula remains the same gameplay-wise, this will be a very welcome effort when it lobs Down Under.

GAME DETAILS

WHY WE CARE: **You get to beat a mate or two playing the best strategy game the PC has to offer.**
DEVELOPER: **Firaxis** www.firaxis.com
PUBLISHER: **Infogrames** www.infogrames.com
PLATFORM: **PC** **DATE:** **4th Qrt 2002**

Republic

Never has a game been as ambitious as Republic, in which you'll engineer major social change through grassroots action – revolution brother! Elixir's Demis Hassabis was enthusiastic as ever when demoing Republic in a quiet corner at E3.

Things have changed since we saw the game last year. Gone are the 16 power factions you have to compete with and in their place are you and a single junta that you must overthrow. The game has become more focused as a result. In your quest for this end you can recruit eight political supporters from anywhere in the game's massive virtual metropolis (which looks mighty tasty, if rather bleak). Your options are also very open: you can recruit proletariat thugs and start a 'fight club'-style political action group, go after religious or academic recruits, or pay off those who live in the expensive end of town, such as bankers and businessmen. You can also engage in up to 150 different political acts by sending minions to perform them or by watching them closely and manipulating their behaviour. Demis demonstrated this by influencing a follower engaged in peaceful protest at the business end of a tank.

You could test the guy's dedication to the cause by sliding a bar across the screen which increases his resolve. If you left the protestor alone he'd probably walk away once the tank got too close, but you could get the sap to martyr himself, which Demis did with an evil grin on his face. Of course, having a martyr for the cause is useless unless the people know about it, which is why you employ 'fight club' thugs to intimidate a journalist into reporting the event in a sympathetic way. This is unusual stuff, but the game is all about co-ordinating specific incidents so that they then impact on your enemies. Republic is structured with a number of chains of events being linked to a major achievement in your political career.

There will be roughly four ways of winning the game and overthrowing the current regime: passive protest, military means, religious uprising or a coup d'état. The sorts of goals you pursue will dictate which end you work towards, with the tank example above being one of the ingredients that send you down the passive road. Now where would a game like this be a big seller?

GAME DETAILS

WHY WE CARE: **You can beat up journalists so that they write what you want them to!**
DEVELOPER: **Elixir** www.elixir-studios.co.uk
PUBLISHER: **Eidos** www.eidos.com
PLATFORM: **PC** **DATE:** **4th Qtr 2002**

Far Cry

At E3 it was clear that the FPS was the genre of choice for developers wanting to push the technological limits, and while Doom III held centre stage there were other developers doing Clever Things™ with their game engines. Far Cry is just such a game as it lets you loose exploring lush outdoor environments.

Far Cry originally began life as a short technology demo for the GeForce 3, but has since gone through a name change (it used to be called X-Isle) and become a major project for German codeshop Crytek. We think this crew (which has a few Aussies in its midst) is on to something, as the game looks like a clever blending of Ghost Recon and Halo, but with better visuals.

You play a local sea captain who gets roped into finding a particular island for a journalist. Before you know it, bullets are whistling past your tender cranium and you are in the middle of a very tense fire fight. There is also talk of other beastly non-human enemies appearing later in the game. The guys from Crytek wouldn't tell us much more about the game's plot, but if you remember some early X-Isle screens you might remember dinosaurs wandering about, so perhaps there is a hint.

The 3D engine in this game is sensational. The outdoor environments are massive – in some cases over four kilometres square. Crytek is using its own proprietary caching technology and it works similar to that in Dungeon Siege to allow seamless loading between different environment regions.

Like Doom III, Crytek uses a 'polybump' technology which makes adding details like facial expressions and creases in clothing much easier with a lower polygon count.

The environment is full of neat touches such as bushes that rustle to indicate an approaching enemy and trees which block the sun and cast ambush-friendly shadows. You'll also be able to send smoke signals and set up remote weapons to further the ambush antics.

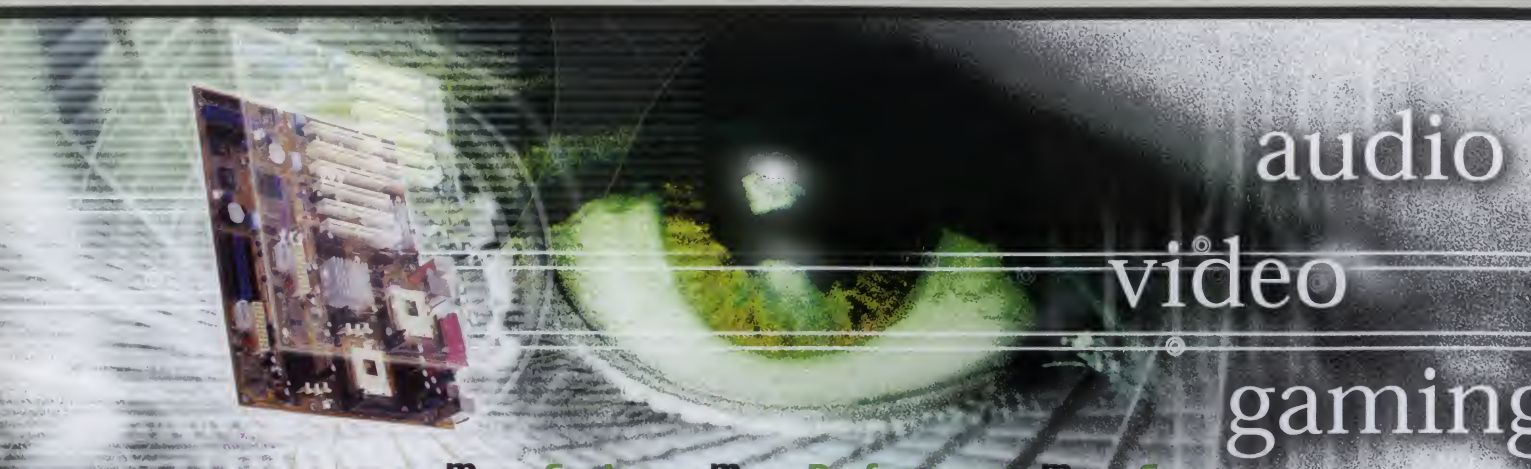
AI plays a big part with enemy soldiers' behaviour characterised by cool stuff such as leaders co-ordinating troops with visible signals which you can then interpret. Loss of a leader leads to confusion among enemy troops – think of the fun you can have with a sniper rifle!

Far Cry still has some time to go before completion, but it is coming together brilliantly and we're all looking forward to a stunning new 3D engine.

GAME DETAILS

WHY WE CARE: **Ambushes, cool lighting effects and lots of fresh grass.**
DEVELOPER: **Crytek** www.crytek.de
PUBLISHER: **Ubisoft** www.ubisoft.com
PLATFORM: **PC** **DATE:** **1st Qtr 2003**

Power 4 the Next Generation



More Features More Performance More Fun

The Immaculate Pentium® 4 Motherboard

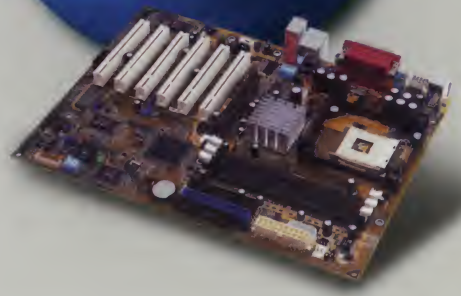
Finally there's a motherboard that gives you everything you need to take computing to the next level. The ASUS® P4B533-V with Intel® 845G chipset delivers everything from Intel® Extreme Graphics for gaming right out of the box, 533MHz front-side-bus support for enhanced performance, USB 2.0 for ultra-fast connectivity, Intel® Application Accelerator support and a wealth of special features to maximize the value of your Pentium® 4 processor.

The Best Motherboard Brand

best of tom's 2001 reader's choice www.tomshardware.com

Winner of Tom's Hardware Guide's Reader's Choice Award

P4B533-V



P4B533-V

- support Intel® Pentium® 4 533/400MHz FSB Processor
- Intel® 845G chipset
- 3 * DDR DIMM Sockets support max. 2GB memory
- 6-channel 3D hardware PCI Audio (optional)
- Intel® 100/10 Mbps Ethernet LAN (optional)
- 6 * USB 2.0 ports
- Integrated 3D graphics
- ATX

USB 2.0 · ASUS EZ Flash · ASUS Multi-Language BIOS · S/PDIF-in/-out interface · ASUS MyLogo2 · ASUS Post Reporter · Extreme Overclocking · AGP warning LED · ASUS Q-Fan · ASUS EZ Plug

Also Available

P4B533-E

- Supports Intel® Pentium® 4 533/400MHz FSB Processor
- Intel® 845E chipset
- 3 x DDR DIMM Sockets support max. 2GB memory
- 6-channel 3D hardware PCI Audio (optional)
- Intel® 100/10 Mbps Ethernet LAN (optional)
- 2 x ATA133 and RAID 0,1 (optional)
- NEC 1394 controller with 2 x 1394 ports (optional)

ASUS EZ Flash

Distributors

* Motherboard may not be exactly as shown. Please confirm specifications with your dealer prior to purchase.

Achieva Technology Australia
Tel: 02-9742-3288
www.achieva.com.au

Cassa Australia
Tel: 07-5445-2992
www.cassa.com.au

ASUSTeK COMPUTER INC.
http://www.asus.com

Stronghold: Crusader

The original Stronghold was the definitive surprise hit: minimal promotion and hype didn't stop it from becoming one of the most popular RTS titles of the last couple of years. The art of building a castle is something gamers have wanted to practice for years, and Stronghold finally gave it to us. Following up on the success of this hit title is Stronghold: Crusader.

This time you'll enslave your minions in the harsh, arid environments of Arabia to take part in the legendary Crusades.

Due to the new landscape and its obvious lack of water, fire becomes one of the most powerful forces in the game. Unless you've constructed your citadel around an oasis, you'll find that your painstakingly built mega structure soon becomes a giant pile of ash and charcoal.

Other than the new units you'd expect, the sequel's main difference to its predecessor is its focus on skirmish mode. The developer realised this mode has helped Age of Empires remain on gamers' hard drives for years, and thus it decided to dedicate much of the sequel's development to improving skirmishes.

Up to eight different lords can control a force during each skirmish, each with distinctive personality, strengths and weaknesses. We watched the developer fire up a game with two AI-controlled lords, one of whom could be called the Francis Greenway of castle construction, while the other built structures about as complicated as your average six-year-old's sand castle. After building our own base, we sent a sortie of infantry to check out the imbecile's base, and approximately 12 seconds later razed it thanks to a few boxes of Red Head matches. While we were at it, our AI opponent sent a raid on our now undefended base, and smote us from the face of the playing field, highlighting the different AI strengths.

CG animations indicate the moods and actions of the different AI lords, helping you decide whether you'd like to form or break alliances with them. If you'd prefer to play against humans, up to eight players can multiplay over LAN or the Net.

If you enjoyed the original Stronghold, you are bound to find the new environment and its resultant shift in tactics, as well as the focus on the skirmish mode, to be more than enough to get your Trebuchet fully erect.

GAME DETAILS

WHY WE CARE: Building castles is fun. So this should be funner than the original. We hope.
DEVELOPER: Gathering of Developers www.godgames.com
PUBLISHER: Take2 Interactive www.take2games.com
PLATFORM: PC DATE: 3rd Qtr 2002

RollerCoaster Tycoon II

Paradoxically a game about the adrenalin pumping experience of roller coaster rides has been one of the real 'sleeper' hits in the PC games industry.

RollerCoaster Tycoon has a fiercely loyal band of fans spending time tweaking their digital fun park designs.

Finally, after about three expansion packs for the original, a proper sequel is due to lob our way, although at first glance the differences between the original game and RollerCoaster Tycoon II appear to be fairly minimal.

However, if you are patient there are some reasonably interesting changes lurking under the superficial veneer of minor graphical tweaks.

For a start, the parks on offer are now much bigger, around four times larger than the original game, with coasters now standing as much as 400 feet high. Chris Sawyer and his team have also been keen to give the gameplay more structure, and to this end you will now have to deal with scripted events triggered during a scenario.

This will make the action more varied when the challenges in a particular park will change as the scripting comes into play. Senior producer Thomas Zahorik, who was demonstrating the game behind closed doors at E3, wouldn't be drawn into too much discussion about the sorts of events the scripting will trigger. However he did smile knowingly when we suggested more obvious options such as fraud, money shortfalls, disasters and changing consumer profiles.

You will also be able to script your own events from within the editor, which looks like being a huge improvement over the previous toolset's approach. The editor lets you design your rollercoaster rides outside of the game space and then after rigorous testing them lets you insert them into the game.

You can also set floor plan size limits for rides so that they fit in your park properly and use these floor plans free from worry in the editor, so that you know your die will fit.

To top it all off, those of you who have been to the hallowed Six Flags coaster parks in the United States of America will be pleased to note that these parks are now in the game.

There'll also be at least six new coasters for you to create and test on people with weak stomachs.

GAME DETAILS

WHY WE CARE: The biggest box of amusement park Lego just trebled in size!
DEVELOPER: Microprose www.Microprose.com
PUBLISHER: Infogrames www.Infogrames.com
PLATFORM: PC DATE: 4th Qrt

The Pentium® 4 Just Got Faster

Mainboard

P4PB

533/400MHz FSB

DDR400 DDR333

AGP 8X

IEEE 1394

USB 2.0

6 Channel Audio

VIA VPSD

P4PA

- Pentium® 4 Processor support @ 400MHz FSB
- DDR266 SDRAM
- USB 2.0
- 10/100 LAN
- ATX

P4MA

- Pentium® 4 Processor support @ 400MHz FSB
- Integrated AGP 4X Graphics
- DDR266 SDRAM
- 10/100 LAN
- Smart Card/Memory Stick
- Micro ATX

EPIA

- VIA C3™ Processor Onboard
- Integrated AGP 2X Graphics
- PC133 SDRAM
- 10/100 LAN
- TV Out
- Mini ITX (170mm x 170mm)

CHECKSUN

Checksun Australia Pty. Ltd
Ph 02 9317-3155
Fax 02 9317-5155
Century Estate
Unit 3, 476 Gardeners Road
Alexandria
NSW 2015
www.checksun.com.au

BCN Technology
www.bcntech.com.au

NSW Office
Ph 02 9648 0888
Fax 02 9648 0999
51 Hill Road
Homebush Bay
NSW 2140

VIC Office
Ph 03 9646 4388
Fax 03 9646 4133
41 Brady Street
South Melbourne
VIC 3205

QLD Office
Ph 07 3852 5288
Fax 07 3852 5299
41 O'Connell Terrace
Bowen Hills
QLD 4006

Xbox Live

At the recent E3 expo, Microsoft unveiled its secret plan to dominate the world. You know the little Ethernet port on the back of your Xbox? It's not just there to get filled up with dust and dirt – it's actually meant to bring the Xbox into the glorious world of multiplayer. Considering the exponential growth of multiplayer gaming, this could be the edge the Xbox needs to become the dominant player on the console block.

US$1 billion can buy you a lot of things. Microsoft is hoping that it's enough cash to launch the first ever successful console online service. A large chunk of this dosh is being pumped into the creation of four datacentres – that's more server resources than the entire amount used to host Microsoft.com – and they're going to be controlled solely by Microsoft, to host the Xbox Live game servers. This means the problem developers currently face (and something Bennett discussed in the Reviews intro a couple of months ago), of who should be responsible for the costs of setting up and maintaining game hosting, has now been cleared up.

Nothing new and great is free these days, and the initial subscription price for Xbox Live is going to be US$10 per month. From what we can gather this one fee covers every game on the service, so you won't need to pay a different amount for each game you play.

To connect online in the first place, yoou'll need to spend US$50 to get an account, a voice communications headset, and the Xbox Live enabled game Revolt. You're going to need a broadband connection at home to play – those with dialup need not apply. Six titles have been announced for the debut of Xbox Live: Unreal Championship, Phantasy Star Online, NFL Fever 2003, MechAssault, Whacked! and Midtown Madness 3.

We heard the voice comms in action at E3, and have to say that the voice effects were a hoot: you can change the sound of your voice, from robotic effects, like Number 5 from *Short Circuit*, to deep and husky, like an operator from a man-to-man-sex phone service. Hopefully these voice filters should stop paedophiles from using the service as an easy way to talk dirty to the kiddies.

Microsoft is comparing the Xbox Live service to an online Disneyland: a pleasant and safe place to leave your kids unattended for hours at a time, without the overt use of security measures. Considering the subscription model, it's not going to be too difficult to ban offensive and obscene users, but we're not quite sure how all those voice comms will be monitored for foul language, or even if swearing is allowed or not. Judging by our trial at E3, 90% of the words transmitted are going to be unsuitable for those under the age of 18.

One of the key features of Xbox Live is Gamertag, which allows you to register a username so that no other gamers can use it, and thus stop them from sullying your gaming reputation. This single username can be used within each and every game, and includes statistics tracking. Proving that you're better at capping the flag in CTF HALO 2 than everyone else will be a simple matter of checking out where you are on that game's statistics ladder. These statistics will also be used for the Opti-match service, which will ensure that certain games will only be for rookies, while others are locked down for the pros.

Unfortunately, by the time Australia gets the Xbox Live service, most of the decent nicknames will have already been registered. While the US, Japan and Europe can all expect the service in October, unlucky Aussies are going to have to wait until at least early 2003. Considering how small our market is, and the costs associated with running a server farm, we wouldn't be surprised if Australia doesn't get its own local server farm, however, Microsoft has stated that an enjoyable service is its first priority, while profits come second.

It appears that we won't even be able to play on overseas servers, although this has not been confirmed, as many genres of games will still be playable with 300ms and above pings. Needless to say we are hoping for more positive news about Xbox Live, as the online capabilities of the Xbox are some of its most promising features.

Rest assured that *Atomic* will continue to keep you updated on the status of Xbox Live Down Under.

The GlacialTech Advantages.....

PERFORMANCE YOU CAN COUNT ON - world class engineering

STYLISH DESIGN - sleek design and attractive colours

5 YEAR WARRANTY - peace of mind and ensures the highest quality and performance available

QUIET OPERATION - highly efficient single fan design

LEADING CLIP TECHNOLOGIES - innovative and easy to use

TOTAL THERMAL SOLUTION PROVIDER

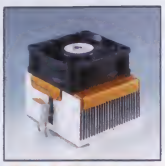
EXCEPTIONAL QUALITY - highest grade materials

GlacialTech

Inspiring Cooling Technology

www.glacialtech.com

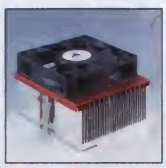
Igloo 2310
Balanced Performance and Efficiency



AMD to 1.67Ghz, XP/MP2000+
Intel to 1.4Ghz
Cooler 70x60x57mm
Fan 60x60x20mm
20.3 CFM, 29dBA, 0.59 C/W
4000 rpm, ball-bearing fan
Silver-based thermal compound

5 Year Warranty!

Igloo 2400
Overclockers Cooler for Socket A and Socket 370



AMD to 2.64Ghz
Intel to 1.4Ghz
Cooler 83x64x51mm
Fan 70x70x15mm
42.6 CFM, 39.6dBA, 0.44 C/W
5000rpm, ball-bearing fan
Silver-based thermal compound

5 Year Warranty!

Igloo 4200
Efficient Reliability and Value

Socket 478, Pentium 4 to 2Ghz
Cooler 83x69x58mm
Fan 60x60x20mm
27 CFM, 35dBA, 0.40 C/W
5000rpm, ball-bearing fan
Silver-based thermal compound

5 Year Warranty!

Igloo 4300
The Best Socket 478 Performance

Socket 478, Pentium 4 to 2.4Ghz
Cooler 83x69x53mm
Fan 670x70x15mm
42 CFM, 38dBA, 0.34 C/W
5000rpm, ball-bearing fan
Silver-based thermal compound

5 Year Warranty!

Learn more at www.cassa.com.au

Distributed by:-

cassaaustralia

National Headquarters
1/14 Hi-Tech Drive, Kunda Park, QLD 4556
Phone (07) 5445 2992 Fax (07) 5445 2069

Melbourne Sales Office
Level 1, 329 Mitcham Road, Mitcham, VIC 3132
Phone (03) 9874 3411 Fax (03) 9873 0500

We are actively seeking
Reseller Partners!
Please call 07 5445 2992 or EMAIL glacialtech@cassa.com.au

DESKTOP, SERVER and CHIPSET solutions.

Serial ATA

The death knell for ATA Ribbon cables has finally sounded, so John Gillooly jacks into the new Serial ATA technology to find out how it ticks.

Apart from the tendency to end the process with less skin on your knuckles than you started with, the most annoying thing about tidying up the guts of your system is the cabling. And the most annoying cables are those fruckin ATA ribbon cables, with their airflow and aesthetic destroying flatness.

Case modders have searched for many solutions to the pain of ribbon cables, from carefully dismembering and rolling them, through to buying pre-made rounded cables. A bunch of technology companies has gone one step further, reinventing the way IDE drives interface with the Host controller, via a snazzy new technology called Serial ATA.

Parallel universe

Way back in 1984, IBM introduced the PC-AT computer, which used a 286 processor, 256KB of system RAM, and at significant extra expense, a 20MB hard drive that interfaced with an ISA card via an Advanced Technology Attachment (ATA) cable.

Then in 1986, as a result of collaboration between Western Digital, Control Data Corporation and Compaq, the IDE drive was born. IDE stands for Integrated Drive Electronics, the combination of hard drive and inbuilt controller electronics, which has become the standard for home computing. IDE used the ATA interface to connect to a host controller, which was located either on the motherboard or an add-in card.

Since that day the ATA and IDE combo has undergone speed boosts and slight evolutionary changes but at heart remains the same. It's more than the ramping of the transfer speed from the initial 3MB/sec up to the 133MB/sec supported by ATA133 – over the years, Parallel ATA has gradually included support for many new technologies, the most significant of which are AT Attachment Program Interface (ATAPI) and Direct Memory Access (DMA).

DMA was first introduced as part of the third generation ATA-2 interface, also known as Enhanced IDE (EIDE). This took the CPU out of the loop, and allowed the hard drives to access the system memory directly. It was a key factor in allowing increased data transfer speed, especially after a refresh to Ultra DMA as part of the fifth generation ATA-4 interface. The role of DMA is demonstrated well when benchmarking; scores in application benchmarks almost double when DMA is enabled.

As ATA was initially created as a hard drive interface, it was not in the best position to cope with the 'multimedia' explosion that took place in the early 1990s. CDROM drives initially worked via custom interfaces, usually coupled with a supporting soundcard, and it took the creation of ATAPI to shift these drives onto the common ATA interface. ATAPI introduced new instruction sets needed to control removable drives such as CDROMs and tape backup drives, and was part of the ATA-4 interface.

Over the 18 years of Parallel ATA's existence the rest of the system has progressed in leaps and bounds, yet the major problem with ATA lies not so much with data bottlenecks but with the pesky ribbon cables. In the current ATX form factor, the cables provide a significant boundary to airflow within the system, and tight restrictions on cable length are a major limiting factor in system design.

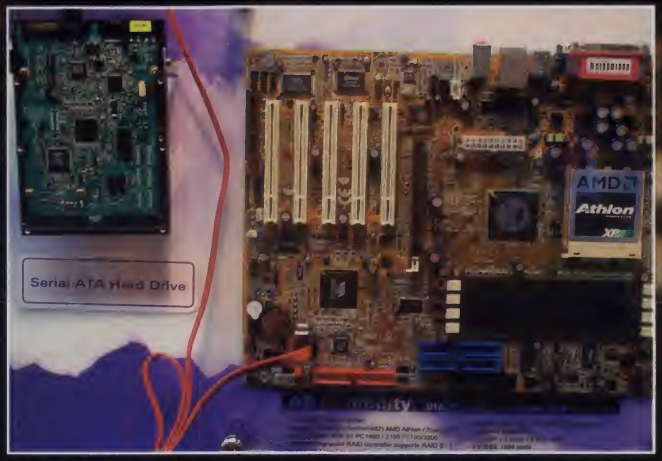
Parallel ATA cables are limited to 46cm in total length, with a 30cm maximum between the host interface connector and the first drive connector. This is done in order to minimise crosstalk, thus maintaining signal integrity. Signal integrity is also an issue if the transfer speed of parallel ATA were to be pushed any further, necessitating seriously funky technical changes to the spec.

There are other issues with parallel ATA: it requires 5-volt transceivers, and that amount of power would blow the mind of chips made with the tiny fabrication processes now being used; and it also requires 26 pins per channel (with added grounding pins), necessitating the huge 40 pin connectors that we are all used to.

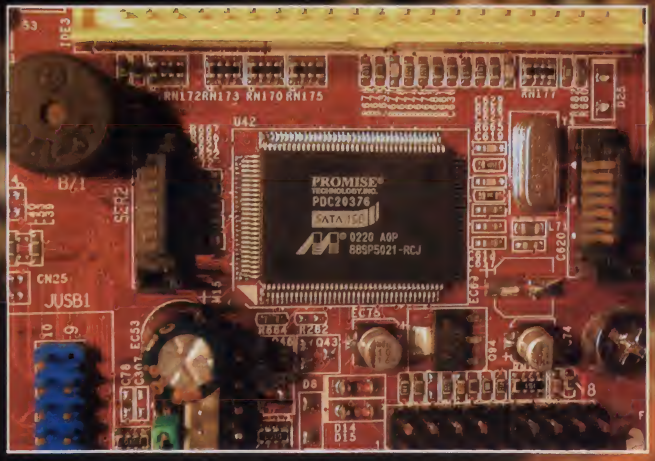
The last issue with Parallel ATA is the familiar Master/Slave drive relationship, in which two devices share the same cable with the host controller. This involves some fancy wiring trickery and can result in degraded performance when differing speed drives are used on the same cable.

Hot, blind mating

Enter Serial ATA, the technology designed to drag ATA out of the last century and keep it bubbling along for the next ten years. The specification has been a work in progress for several years now, spearheaded by the Serial ATA Working Group, of which Maxtor, Seagate, IBM, Intel, Dell and APT



ABOVE: DFI is one of many mobo makers with SATA solutions in development.



ABOVE: Promise's SATA chip with accompaning host controller connectors.

Technologies are the main members.

In keeping with the philosophy de jour of OS level transparency of new technology, Serial ATA is a fully backwards-compatible technology, but it eliminates all the major issues that are currently found with Parallel ATA. The most instantly noticeable aspect is the dramatically different cabling. Rather than the 80-pin ATA ribbon cables, Serial ATA devices use cables that look like enlarged telephone cables. The connectors are tiny in comparison to parallel ATA ones, and are designed with several things in mind: Serial ATA incorporates support for hot plugging drives (attaching drives to a system while it is running); and the plugs are designed to be 'blind mateable' to facilitate this. This means that they use an asymmetric design, so that they can only be inserted one way, allowing easy reconnection when trying to plug in a drive by feel only.

Drives will require two plugs, the first of which is the actual Serial ATA data connector, consisting of seven pins. Four of these are for data transfer, and the other three are grounded. This is a huge departure from the parallel ATA plug, in which there are a total of 40 pins. This allows a huge plug size reduction, with the Serial ATA plug clocking in at only 14mm in width and 3.5mm in depth, as opposed to the 55mm width and 5mm depth of Parallel ATA plugs.

Although the data connection is smaller, the power connector for Serial ATA drives is much larger than the existing four-pin Molex plug. While Molex plugs supply drives with +12V and +5V power, the new Serial ATA plugs supply +12V, +5V and 3.3V. The addition of 3.3V enables support for future low power devices and is important in the mobile computing realm.

By now you are probably feeling slightly miffed that the gold plated, triple fan ATX 12V power supply you just bought is going to be made redundant by the need for a new hard drive power connector. But never fear, for the foreseeable future 3.5in drives will come with both the new SATA power connector and the common four-pin Molex connector as standard.

Whistler-ing in the dark

Just like the upcoming PCI replacement, PCI-Express, Serial ATA has been designed to be OS-Transparent. This means that as far as the operating system is concerned Serial ATA drives are just bloody quick parallel ones.

The first generation of Serial ATA supporting motherboards have two host controller connectors. As far as the operating system is concerned, drives attached to the controllers will be seen as Master devices located on different ports: the Master/Slave relationship that is integral to Parallel ATA devices is still technically in existence with Serial ATA, but drives will only ever appear to the OS as Master devices.

By doing this, all Serial ATA drives will be capable of performing to the theoretical first generation data transfer speed of 150MB per second without the need for any special drivers or software updates.

Communication is the key

As the name implies, Serial ATA uses serial data transfer for communication between the IDE controller on the hard drive and the host interface on a motherboard or expansion card. The Serial ATA pipeline uses four wires, two for upstream data transfer and two for downstream transfers.

In an idle state both the drive and the host constantly transmit a synchronise signal. This has a twofold purpose: it keeps the devices primed for data transfer and it also provides a role in calibrating the signal between the device and host.

When the host needs to request data, it sends a ready signal to the device, which in turn replies with a ready signal of its own. This is then followed by the requested data. Once it receives the data, the host then replies with an acknowledgement, which is sent constantly until all the data is received. Data transfer is completed by the addition of a Cyclic Redundancy Code (CRC), which is decoded by the host controller, which completes the transaction by sending an acknowledgement down the wire to the device, at which point they both breathe a sigh of relief and return to spamming each other with synchronise signals.

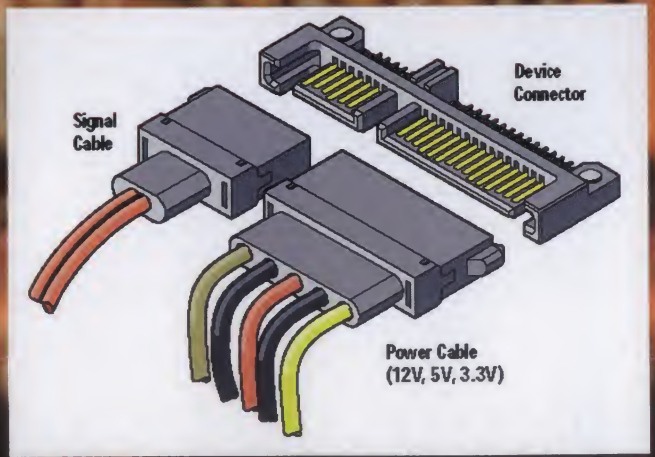
It is much simpler than the complexity of Parallel ATA, in which the interactions between the Master and Slave devices alone are enough to cause headaches, and require IDE controllers to act as high tech traffic controllers alongside the basic role of getting data on and off the hard disk.

Stay tuned

All the requisite pieces of hardware that are required by Serial ATA 1.0 will be popping up very soon. Its first appearance has always been expected to be through the use of expansion cards, however the prevalence of Serial ATA controllers on motherboards at Computex this year means that onboard Serial ATA should be with us real soon now.

The major drive manufacturers all have products in varying stages of development, and at the Asia Pacific IDF earlier this year Intel demoed a system using add-in cards from Promise and Silicon Image to run drives made by Western Digital, Fujitsu, Samsung and Maxtor. There is definitely a sense of realism amongst the Serial ATA working group and we can expect a long phase-in period where Serial and Parallel ATA technologies will be operating side by side for some time yet.

Rather than rest on its laurels, the Serial ATA working group has now begun development of Serial ATA II, which adds features for network storage and server applications while doubling the transfer speed to 300MB/s. This is expected to be ratified and hit the market in late 2004.



ABOVE: The new data and power connections for interfacing with SATA drives.

ABOVE: The plugs are much smaller than the current Parallel ATA connectors.

Video cards versus CPUs

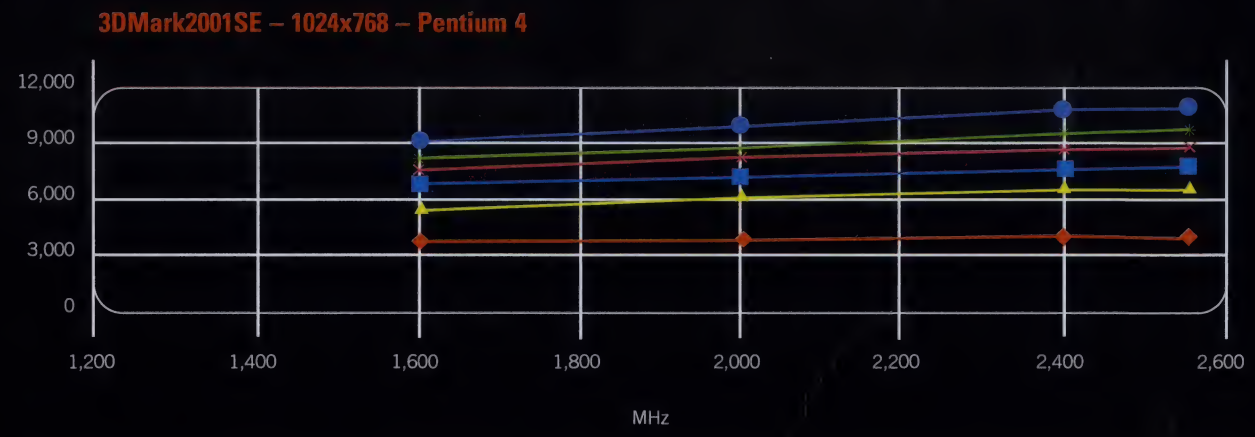
John Gillooly embarks on a benchmarking opus to prove whether CPU or video card upgrades are better value.

The steady march of CPU and video card speed continues, driven by the law laid down by Gordon Moore many moons ago. As these components get quicker and quicker, it can get confusing working out just what the best possible combination of CPU and video card is. Seeing as our systems have become a cascading series of bottlenecks, there will come a point at which either the video card or the CPU will hold the other back.

When this happens, the system is either CPU or video card limited. Diagnosing such situations is not an easy thing to do. To see when a system becomes CPU or video card limited there is a need for testing to ascertain just where the bottlenecks occur. Of course, system bottlenecks can be due to other factors like motherboard chipsets, but this is head to head, and we have kept the chipset differences to a minimum while pitting CPUs against video cards.

For this purpose we have used eight CPUs, four Athlons and four Pentium 4s, and six video cards, all representative of different chipsets. The Athlon tests have been undertaken on our KT266E based ASUS A7V266E testbench, while the Pentium 4 tests were conducted on our new ABIT BD7II-RAID i845E based testbench. The video chipsets tested are GeForce2 GTS, GeForce4 MX460, RADEON 8500, GeForce3, GeForce4 Ti 4200 and GeForce4 Ti4600, encompassing the most popular families on the video card market.

We tested in 3DMark2001SE and Serious Sam SE, both of which showed similar trends. We have included graphs of the 3DMark2001SE results, done in a slightly different style to the usual in order to incorporate the sheer number of benchmark results in a meaningful way. To accurately represent results between the different CPUs the graphs are based upon the speed of the CPU in MHz. And as the opinions of AMD and Intel differ on the relevance of MHz (and also because this isn't another Intel versus AMD



GeForce2 GTS
GeForce3
GeForce4 MX460
RADEON 8500
GeForce4 Ti4200
GeForce4 Ti4600

AK35GTR V 2.X

Ultimate Pursuit of Performance

VIA we connect KT333

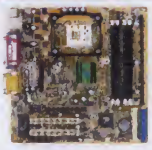
AK35GTR V2.X

VIA VT KT333/VT8233A Chipset
Supports AMD K7 Athlon/Duron FSB 200/266 Processors
Four DDR DIMM supports up to 4GB
PC1600/PC2100/PC2700 DDR DIMM
Supports AGP 4X, and 4 USB ports (1.1)
Supports UDMA ATA 133/100/66/33 IDE interface
Onboard High Point 372 ATA-133 IDE RAID support
Onboard C-Media 6ch. H/W Audio support
Hardware Monitoring supports

MS51N

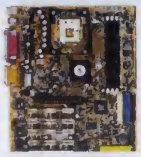
SIS 650/SIS 961 Chipset
Support Socket 478 Intel Processors
Two DDR DIMM supports up to 2GB PC1600/PC2100 DDR DIMM
Supports AGP 4X, and 6 USB ports (1.1)
Onboard Realtek 8100 10/100 Ethernet
Supports UDMA ATA 100/66/33 IDE interface
Onboard AC97 audio

MV42N



VIA P4M266/VT8233 Chipset
Supports Socket478 Intel Processors
Two DDR DIMM supports up to 2GB PC1600/PC2100 DDR DIMM,
Two SDR DIMM supports PC100/PC133
Supports AGP 4X, and 6 USB ports (1.1)
Supports UDMA ATA 100/66/33 IDE interface
Onboard VIA VT6103 10/100 Ethernet
Onboard AC97 Audio support

AV45GTR



VIA P4X266A/VT8233 Chipset
Supports Socket 478 Intel Processors
Three DDR DIMM supports up to 3GB PC1600/PC2100 DDR DIMM
Supports AGP 4X and 6 USB ports (1.1)
Support UDMA ATA 100/66/33 IDE interface
Onboard High Point 372 ATA-133 IDE RAID support
Onboard C-Media 6ch. H/W Audio support
Onboard USB 2.0 compliant (Optional)

Shuttle®
www.spacewalker.com

Manufacturer:
Shuttle Inc. TAIWAN

Tel: 888-2-8792-6168
Fax: 886-2-8792-6268
E-Mail: sales@Mail.Shuttlegroup.com.au

SATO TECHNOLOGY

SATO Technology Pty Ltd
WWW.SATOTECH.COM.AU
e-mail:albert@satotech.com.au

Box Hill South, Vic	Silverwater, NSW	Kingsgrove, NSW	Rocklea, QLD	Osborne Park, WA
Tel:(03) 9899 6333	Tel:(02) 9737 0633	Tel:(02) 9554 3826	Tel:(07) 3255 6899	Tel:(08) 9244 8688
Fax:(03) 9899 0200	Fax:(02) 9739 0877	Fax:(02) 9554 9589	Fax:(07) 3255 6459	Fax:(08) 9244 2280

* All other brand or product names are trademarks or registered trademarks of their respective holders.

showdown), the Athlon and Pentium 4 results are plotted on different graphs.

In a situation where a video card is scaling well with the CPU the 3DMark score should increase as CPU speed increases, however as a video card reaches its peak performance the line will flatten out. The scalability is also resolution dependent.

A CPU pumps the same number of polygons to the video card regardless of resolution, however increased resolution means more pixels for the video card to output to the screen, so the higher the screen resolution, the sooner the card will slam into the performance wall.

We have shown results for the 'standard' 3DMark2001SE Pro resolution of 1,024x768 as well as high-resolution 1600x1200 results.

The results show that the vast majority of cards are still scaling beautifully at 1024x768. With the exception of the now long in the tooth GeForce2 GTS, which delivers paltry differences between CPUs, all cards are showing increasing performance with CPU speed, with no CPU limitation in sight. The performance gaps between cards also stay consistent as speed increases.

It is at the high resolution of 1600x1200 that variations in performance become apparent. Yet again the GeForce2 GTS shows its lack of scaling, but we can now add both the GeForce3 and the GeForce4 MX460 to the list of cards that have hit their limitations. The GeForce4 Ti cards and the RADEON 8500 are still scaling well.

It is interesting to note that the difference in benchmark results as CPU speeds increase is not particularly incredible. While the jump is in the order of one or two thousand 3DMarks at 1024x768, at 1600x1200 the difference is much lower, sitting well into the sub-1000 range.

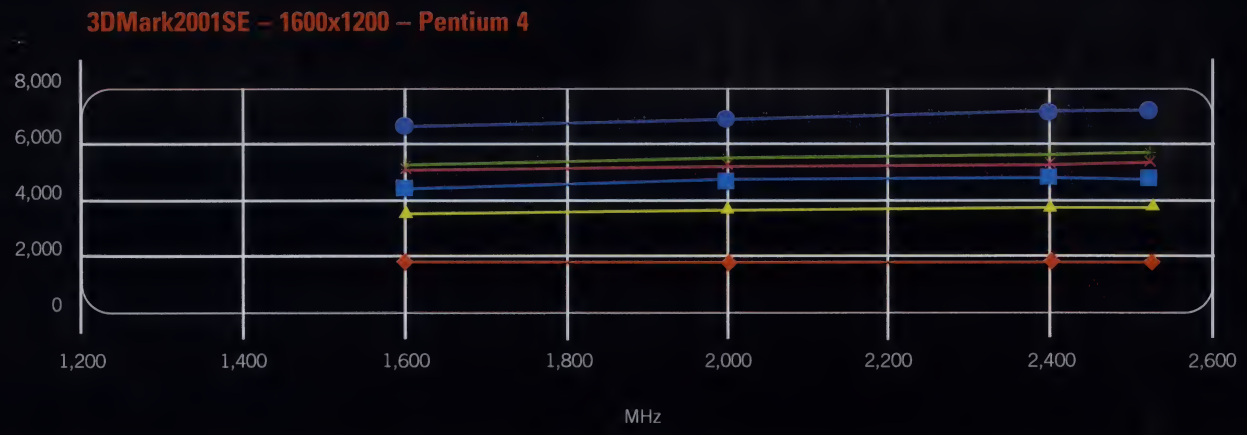
The results also provide a good matrix for choosing your next gaming hardware upgrade.

It would be insane for owners of a GeForce2 or below to jump to the latest 2.53GHz CPU and expect a huge jump in gaming performance. Instead it may be better to choose a comfortable medium of a small CPU upgrade accompanied by a reasonable video card chipset leap.

It also helps to give an inkling of just how well the current generation of video cards will scale as CPU speeds continue their increase.

At present, the two chipsets that show consistently good performance without breaking the bank are the RADEON 8500 and the GeForce4 Ti4200, and these graphs show that they are both keeping up with modern CPUs, even at high resolutions.

When it comes to a direct question of whether CPU or video card upgrades are a better option, the answer is yes. What path is right for you is much more dependent upon your current setup and where on the performance curve you want to end up. We have provided the means, now you can see where your system will sit.



GeForce2 GTS
GeForce3
GeForce4 MX460
RADEON 8500
GeForce4 Ti4200
GeForce4 Ti4600

We live in a world of data. Move yours.

Being married to your work doesn't mean you should be tied down to your office desk. With Iomega® Zip® drives and disks, you can take your critical files out of the office and work anywhere.

- *USB powered external storage that requires no cables*
- *ideal travel companions for people on the go*
- *easy to use: just plug and play. To transfer files, simply click, drag and drop*
- *work with nearly all mobile and desktop computers*
- *Iomega® QuikSync™ software automatically backs up your data, protecting it from system crashes, viruses and power outages*

iomega™

iomega®

www.iomega.com

Iomega Sales &Technical Support: 1800 IOMEGA (466342)

Copyright © 2002 Iomega Corporation. All rights reserved.Iomega,the stylized "i" logo and Iomega product brand blocks are either registered trademarks or trademarks of Iomega Corporation in the United States and/or other countries.Certain other product names, brand names and company names may be trademarks or designations of their respective owners.

The future of flight sims

Military flight sims have always been on the cutting edge of Maximum Power Computing. Bennett Ring looks at how far they've progressed over the last two generations.

ABOVE: The world's most powerful dual hairdryer.

ABOVE: A view of Bennett from the OFT's pilot monitoring camera.

The reasons the RAAF uses flight simulators are blindingly obvious. First and foremost is the cost saving: when you consider it costs approximately $12,000 per hour to fly the real F/A-18 Hornet, it's easy to imagine the massive savings made when a large part of pilot training occurs in a simulator. It also places less strain on the real aircraft airframes, meaning the RAAF doesn't need to replace its jets as soon. Then there is the safety factor: a simulated ground attack run is much less likely to wipe out your trainee pilots than a real life close encounter with the ground. And finally, the ability to simulate emergency situations is something that simply can't be done in the real aircraft. For example, it's quite dangerous to shut down and restart an engine in the real Hawk jet aircraft in flight, but this can be done at the flick of a switch in the simulator.

While the actual running costs of a simulator are minimal when compared to a real aircraft, the purchase price certainly isn't. For a decent military-spec simulator, expect to pay more for the simulator than the actual aircraft.

F/A-18 OFT

The first unit we had the chance to put through its paces was the F/A-18 OFT, or Operational Flight Trainer, which was installed by the Sperry Corporation in 1986. It might have been cutting edge back then, but by today's standards its hardware is definitely ageing. Hence, an upgrade program will see the computers that drive the simulation upgraded to current technology over the next couple of years. Surprisingly, the original mainframes still do the job extremely well, regardless of their ageing hardware.

The main part of the unit is a 100% faithfully recreated F/A-18 cockpit, and when the RAAF says 100% accurate, you can be sure it means it. Judging by the look we had at the real cockpit and that of the sim, we'd have to agree that the sim cockpit replicates that of the real Hornet perfectly. This includes the MFDs (Multi Function Displays), but unfortunately the ejection mechanism isn't included for an obvious reason – cleaning pilot paddies off the sim room ceiling isn't in the cleaner's job description. Most of the components within the simulator are from the real aircraft, although it also uses custom built replicas for certain controls.

Unfortunately we weren't able to test out the radar system, as this is highly classified material, and the RAAF Military Police would have to kill us if we'd seen it. But according to the RAAF, the air-to-air

ABOVE: The TWSTS's giant wraparound screen when not in use.

ABOVE: The TWSTS remote station allows the pilot to configure his mission.

ABOVE: The OFT in all its glory. The white boxes contain three CRT monitors in a columnated configuration.

EXPLOSIVE 1:3

ABOVE: The real deal – a Hornet at rest.

methodology of the radar is totally faithful to the original, and includes the ability for the sim operator to change the radar cross section of different bogies as well as to simulate the effects of ECM. Speaking of sim operators, both of the simulators we saw were highly complex pieces of machinery. Therefore there is a need for a single simulation operator to man a special station, from which every aspect of the simulation is controlled. In the F/A-18 OFT, a closed circuit camera system shows the operator a view from the cockpit of the pilot's face, as you can see from our editorial shots.

Ground attack isn't modelled quite as precisely as the air-to-air radar, as it doesn't simulate the effect of ground clutter (the distortion caused by radar signals bouncing off terrain).

To provide motion queuing, air bladders are installed in both the seat and the pilot's harness. As the sim accelerates, these are inflated to give the pilot the impression that he is being pulled back into the seat. Likewise with rolls, as each side of the seat inflates or deflates to indicate the direction of the roll.

The visuals, especially when compared with today's current PC flight sims such as IL2 Sturmovik, are very basic. A maximum of five colours and sixteen textures can be displayed, at an average framerate of thirty frames per second. Three CRT monitors are set up using a columnated system, which means they bounce the display off mirrors onto three merged screens. This gives the display depth of field, and a viewing area of 135 degrees lateral, 35 degrees vertical. Due to the use of this type of display, a fully working HUD (Heads Up Display) from the real aircraft is used in the sim.

The sound system in use on the OFT also fully replicates the wide range of

F/A-18 OFT

- 3 x CRT monitors in columnated configuration (FOV = 135 degrees lateral, 35 degrees vertical)
- Gould 32/8780 @ 13MHz mainframe
- Gould 32/9750 @ 13MHz mainframe
- Reflective memory system
- 900MB HD space
- 1 x PowerPC

Hawk TWSTS

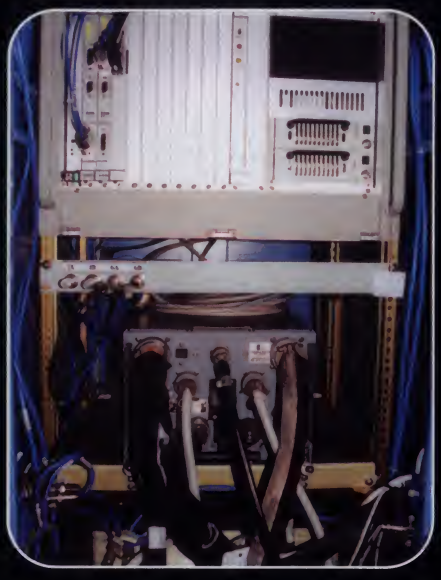
- 3 x CRT projectors @ 1280 x 1024 resolution (FOV = 180 degrees lateral, 50 degrees vertical)
- SGI Onyx2 visualisation system
- SGI Digiblend
- 2 x SGI Octane workstations
- 4 x SGI O2 workstations
- 1 x 200MHz PC
- Alpha workstation

ABOVE: The OFT's operator station.

ABOVE: The Hawk jet trainer.

ABOVE: The TWSTS's Four SGI O2s.

ABOVE: Gould mainframes power the OFT.



ABOVE: An OFT PowerPC and F/A-18 flight computer.

ABOVE: Ph34r the massive SGI Onyx2.

beeps and tones heard in the real aircraft. Everybody's favourite nag, Bitching Betty, is also included, as we heard when Ben almost piled into the ground while making a 500 knot run at an altitude of 100 feet. Speaking of which, it was quite amusing to see the instructors freaking out whenever any of the *Atomic* staff pulled off dangerous manoeuvres – real pilots must fly the simulator within the same safety constraints as the real aircraft to discourage dangerous habits.

Considering that the hardware driving the F/A-18 OFT is 16 years old, we weren't expecting to see any Silicon Graphics or Alpha workstations doing the work behind the scenes. Instead the sim is powered by two massive mainframes located in a specially cooled room next to the OFT area. The first of the mainframes is a Gould 32/8780, while the second is a Gould 32/9750, both of which run at the zippy speed of 13MHz. No, we're not joking. These are linked by reflective memory, meaning that each mainframe's dedicated memory is updated continuously to contain the same values as the other mainframe. 900MB of hard drive space is provided courtesy of three hard drives which, back in 1986, was an absolutely massive amount. To accurately model the F/A-18 avionics systems, a couple of real Hornet flight computers are used.

The venerable FORTRAN language is used for most of the simulation's code, as well as Gould assembler, and the entire program weighs in at approximately 1,000,000 lines.

To update some of this ageing hardware, a PowerPC was installed to take care of the navigation and IFF (Identify Friend or Foe) systems, as well as handling the sound systems. According to the sim operators, the installation of another PowerPC should take care of the rest of the simulation's systems, allowing the mainframes to retire into the land of obsolescence where they so rightly belong.

While the OFT seems archaic, it does what it needs to do, which is teaching graduate pilots how to use the F/A-18's avionics. By the time pilots reach the OFT, they've already learnt how to fly a jet aircraft. As a sign of just how faithfully the OFT recreates the F/A-18's flight model, it is used extensively by the Roulettes for aerobatic training.

BAe Hawk 100 TWSTS

While the OFT uses very dated hardware, the same cannot be said of the BAe Hawk Simulator, which is known as the Tactical Weapon System Training System, or TWSTS for short. The Hawk is the RAAF's new jet aircraft trainer, used as an intermediary training platform between the PC-9 and the F/A-18. The TWSTS is a mere 18 months old, which is reflected in the high end Silicon Graphics hardware that powers the simulator.

A single seat Hawk cockpit is fully replicated, including the four 640 x 480 LCDs which are used to display the aircraft systems. Instead of a fully enclosed cockpit with screens at the front, as is the case with the F/A-18 OFT, a massive curved screen encompasses the cockpit replica. Three giant CRT projectors fill this screen, giving the user a 180-degree lateral, 50-degree vertical field of view. Each of these projects a highly detailed landscape based on a satellite topographic terrain database, at a resolution of 1280 x 1024 and an average of 30 frames per second, although we did notice the occasional bout of chugging. We were quite surprised to notice this slowdown, as the simulator only uses a maximum of 50% of its processing power, which was an RAAF requirement when the sim was being built.

The Hawk sim has a massive increase in visual quality over the F/A-18 OFT, and thus creates an immeasurably more immersive simulation. This is a good thing, as the Hawk sim is more about teaching the pilot how to fly a fast jet, whereas the F/A-18 OFT focuses on that aircraft's systems. In fact, it's so immersive that if you stand in line with the middle of the screen beside the cockpit as the plane banks it's not unusual to fall over. Pilots aren't allowed to fly the real Hawk less than two hours after flying the simulator because of the disorientation that this immersion can cause. Due to the use of this type of display, the aircraft's HUD is projected onto the screens, instead of using a real life HUD on the cockpit frame. The simulator is controlled via an operator's station, which uses three different touch screens. One of these shows a digital replica of every switch and control panel in the cockpit, another displays the landscape graphics, while the third is used to set up each mission.

. . .the installation of another PowerPC should take care of the rest of the simulation's systems, allowing the mainframes to retire. . .

ABOVE: The Hawk's glass cockpit during a mission is a hive of activity.

ABOVE: The operator's station controls all aspects of the mission.

ABOVE: Movement is conveyed strongly thanks to the wrap-around screen.

Considering just how much more detailed and immersive the visuals are, it's no surprise to see that this simulator is powered by a range of different Silicon Graphics Inc machines. The biggest box is the SGI Onyx2 visualisation system, with its 4 MIPS R10000 CPUs, an 18GB Hard Drive and 2048MB of RAM to provide the visuals for the three projectors. To seamlessly blend the three different projected images from the three CRT projectors, an SGI Onyx Digiblend is used. Two SGI Octane units are used for the Instructor's Station visuals and operating software, while four SGI O2 workstations take care of the flight model and all of the aircraft systems. An Alpha workstation is used to control the aircraft Operational Flight Program (OFP), and this uses a close port of the actual aircraft's software. By doing so, it is a simple task to upgrade the simulator's software at the same time as the real aircraft's software is upgraded. Finally, a 200MHz PC is used to calculate the force feedback effects on the control stick and rudder pedals.

Thanks to the RAAF gods, the *Atomic* crew was allowed to fly both simulators for approximately one hour, and we have to say that both aircraft are a breeze to control, especially the F/A-18. We practiced a range of manoeuvres, including landings, touch-and-gos, formation flying, gunnery and missile launches. Due to our ineptitude we didn't know how to trim the Hawk, so piloting this aircraft wasn't quite as easy as we expected from a training aircraft, due to the sizeable pressure needed to move the stick when climbing or diving. The flight computers of the Hornet made this jet a much simpler affair to get pointed in the direction we wanted it to go.

So just how do these simulators compare to those found on the PC? As far as visuals are concerned, neither come close to the level of detail found on your latest GeForce4, 2GHz+ beast running any flight sim from the last couple of years. Yes, that includes the SGI powered brute. However, a 21" monitor can't compare with the giant 20-foot wraparound screen used on the Hawk sim. Likewise with the PC's mouse, keyboard and HOTAS controllers, which are a far cry from a fully replicated cockpit. Who needs gorgeous graphics when you've got a fully working glass cockpit? In fact, due to the funky F/A-18 cockpit, we barely noticed just how primitive its graphics were. As for the flight models, based on our limited real world and extensive simulator experience, the military versions didn't appear to be any more advanced than what we've seen in hardcore PC flight sims such as Falcon 4 and IL2 Sturmovik.

However, just because we didn't notice the difference doesn't mean there isn't one: according to the RAAF pilots both simulators are totally faithful to the flight model of the real aircraft. Unfortunately, due to the secrecy of their capabilities, we were unable to test the functionality of the radar and weaponry systems.

A huge thankyou must go out to Flt Lt Christine Bradley, who was our tour for the day, as well as all personnel at BAe and RAAF Williamtown for allowing us to play with some of the RAAF's most advanced toys. After comparing the older F/A-18 simulator with the sparkling new BAe Hawk simulator, it was hard not to be impressed by the quantum leap in computer technology used on military flight sims.

Now all they need is a suit that can replicate G-forces, and the real aircraft could be mothballed, only to be used in times of conflict. . .

metalbox systems™

The metalbox Difference

- Fully Customisable
- Built by metalbox systems skilled technicians
- Strigent 200+ point Quality Control Process
- Completes with BENCHMARK SCORES
- Cable neatly tied for efficiency in Cooling
- Integrated Cooling Solutions
- Upgrades available at discount price
- Tested for 72 Hours before Despatch

metalbox [Pt]™

metalbox [Ti]™

TiO5 - HOME USER

AMD® Duron 900MHz
Albatron KX400+ AMD DDR400 Motherboard
128MB Pc266 DDR Ram
Albatron GeForce 2 MX400 64MB Graphics
20GB ATA133 HDD
BENQ® 52X CDRom
BENQ® 15" Monitor
BENQ® Keyboard
Microsoft® Trekker Mouse
56K Internal Modem
Microsoft® Windows XP Home

$1,300.00
$13.62 per week*

metalbox [Pt]™

PtO5 - WORKSTATION

AMD® Athlon XP 1800+
Albatron KX400+ AMD DDR400 Motherboard
128MB Pc266 DDR Ram
Albatron GeForce 2 MX400 64MB Graphics
30GB ATA133 HDD
10/100 Fast Network
BENQ® 52X CDRom
BENQ® 15" Silver Flat Panel
BENQ® Keyboard
Microsoft® Trekker Mouse
Microsoft® Office XP S.B.E.
Microsoft® Windows® XP Professional

$2,670.00
$26.31 per week*

metalbox [Bε]™

BεF7 - GAMING SYSTEM

AMD® Athlon XP 2100+
Albatron KX400+ AMD DDR400 Motherboard
512MB Pc266 DDR Ram
Albatron GeForce4 Ti 4600 128MB DDR
60GB ATA133 HDD
Pioneer 16X DVDRom
Logitech Freedom Pro Keyboard & Mouse
Creative Audigy D.E
Creative Inspire DTT5700 Speakers
Sony 21" CPD-G520 Monitor
Microsoft® Windows® XP Professional

$4,995.00
$46.15 per week*

Performance is defined as responsiveness and processing power that empowers your PC to support new applications and usage models. So no matter whether its for business or pleasure, **metalbox systems™** ensures that you have the best user experience at any time.

all metalbox systems™ come with 1 year Australia wide onsite warranty**

ACKNOWLEDGEMENT: Intel, the Intel Inside logo, Pentium and Celeron are trademark or registered trademark of Intel Corporation or its subsidiaries in the United States and other countries. Microsoft and Windows are trademarks or registered trademarks of Microsoft Corporation in the United States and other countries. All other brands and product names are trademarks of their respective owners. **FINANCE:** *Intel® Financial Services payments quoted are based on a 36 month commercial rental agreement or consumer lease, payable monthly. Rental payments include GST. Subject to credit approval. Conditions apply. **WARRANTY:** **Onsite warranty services provided by Warranty Assistance Australia (WAA). Please call 1300 653 394 to confirm coverage in your area. Onsite Warranty does not apply to notebooks. All Notebooks quoted are based on 2 years Return-To-Base warranty. **DISCLAIMER:** All images are for illustrative use only. All prices are GST inclusive and for cash or bank cheque only. E & OE Prices are subject to change without notice. All card transactions might incur a surcharge where applicable.

metalboxsystems.com | 1300 654 637

enjoy *business and pleasure* with metalbox systems™

metalbook [Hg]™

HgO - DV WORKSTATION

Intel® Pentium® 4 Processor 1.7GHz
256MB SDRam (Expandable to 1GB)
ATI 16MB M6-D DDR 3D Graphics
20GB Ultra ATA HDD
2X USB and 1X IEEE1394 Firewire Port Built In
56K Internal Modem and Fast 10/100 Ethernet Network
DVD/CDRW Combo Drive (8xDVD, 8x4x24 CDRW)
14.1" XGA TFT Display
Microsoft® Office XP
Microsoft® Windows® XP Professional
Dimension: 313 (W) x 263 (D) x 36/41 (H) mm
Weight: 2.95 Kg

$3,807.00
$36.23 per week*

metalbook [Hg]™

HgF - 3D WORKSTATION

Intel® Mobile Pentium® 4 Processor 1.6GHz
With Intel SpeedStep Technology
256MB DDR SDRam (Expandable to 1GB)
ATI 64MB DDR M7-D Radeon 7500 3D Graphics
40GB Ultra ATA HDD
4X USB and 1X IEEE1394 Firewire Port Built In
56K Internal Modem and Fast 10/100 Ethernet Network
DVD/CDRW Combo Drive (8xDVD, 8x4x24 CDRW)
Front Panel Audio DJ with separate power switch
15" SXGA TFT Display
Microsoft® Office XP Professional
Microsoft® Windows® XP Professional
Dimension: 330 (W) x 289 (D) x 43 (H) mm
Weight: 4.3 Kg (with Battery)

$4,430.00
$42.00 per week*

metalbox systems use genuine Microsoft® products
www.microsoft.com/piracy/howtotell

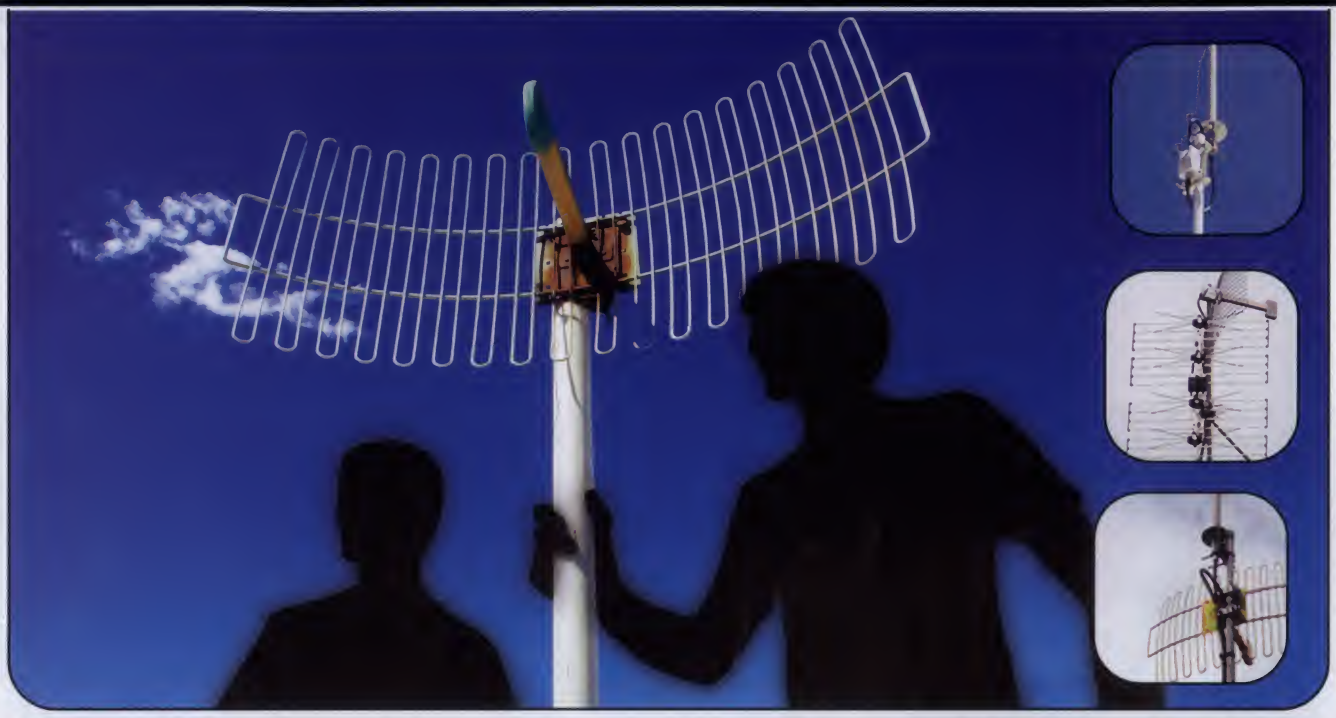
Microsoft® Windows® xp Professional

Microsoft® Office xp

Microsoft Office XP:
Word 2002
Excel 2002
Powerpoint 2002
Publisher 2002
Outlook 2002
Access 2002
www.microsoft.com/office

Taking over the airwaves

Andrew Phillips infiltrates a small but determined group of gamers, file-sharers, and network buffs who are taking their data to the sky – and they want to take you with them. . .



It's like being around just before Napster took off completely and eventually became a cliché; it's the feeling of being 'in' on the next big thing. The next big thing, as many people are claiming, is wireless community networking.

Across Australia dozens of these community networks, or 'meshes', are popping up in major cities and regional areas. Countless other, smaller one-on-one connections have also been established. This relatively old technology (circa 1999) with the catchy title 802.11b, currently enables an 11Mb/s data transfer rate across distances up to 15km (25km is not uncommon), provided the dish has a good line-of-sight to the receiver.

If you can't beat 'em, build your own

An important factor in the quick take-up of 802.11b in Australia has been due to our constant lack of cheap and reliable broadband access. But who needs broadband when it's now possible to connect to your city's community mesh network and Own your neighbors at Quake? If low-ping (under 10ms) online gaming isn't your thing, how about high-speed file sharing, or more importantly, free video and data enabled phone calls? If you live in a large city, chances are that there is a network being established right under your nose. Even country towns such as Bendigo, Mudgee, Leeming, Toowoomba and Albany are already leading the regional push for wireless broadband. This corporation-free, user-created network is what many people envision as the future of communications. In most cases, mesh organizers do not charge a monthly fee, but may charge a small membership fee each year, which goes towards improving the network. Many mesh communities are hopeful each city or town will eventually be linked to each other to create a high-speed, information rich network, similar to – you guessed it – the Internet.

However, Melbourne Wireless President Steven Haigh insists Telstra has nothing to worry about:

'I don't think we have much to compete with Telstra. . . sure, we may end up with an excellent quality network, but we're not exactly a huge corporation with plans to take over the world. Hopefully we'll give Telstra some insight

Possible applications

So what's the good of having such a fast network without Internet access? There are many ways of using the network to your advantage: imagine inviting neighbors A and B over for lunch at the same time via video conferencing, or announcing it via the local notice board, already setup as everyone's homepage. Setting up a SHOUTcast sever to act as the community radio station would be a snap, and would also be easily accessible via the local homepage. The more technically-minded users would be able to vote on proposed changes/updates to the network, effectively placing control back into the hands of users, instead of corporations.

It's all about people getting together to share information. Many feel confined by the commercial friendly eyesore the Internet has become, with spam, pop-ups and spyware infecting the user's Internet experience. If the wireless network phenomenon continues to gain momentum, and as more and more cities develop community networks, we may well see a free, Australia-wide wireless network materialize. This would have a huge impact on the current Telstra-centric system we have in place at the moment, and open the door to an unlimited number of possibilities.

ABOVE: Few people know that this dish doubles as a death-ray

ABOVE: Always consult with neighbours before erecting 200ft towers

'. . .data and information wants to be free. I'm trying to find a way to get people in touch with information as easily as possible. There are numerous other groups with similar aims in Australia.' – Steven Haigh

on how people want data services to be.'

When it comes to connecting to other meshes later down the track, Haigh is a little hesitant but still hopeful:

'I can't say this is one of our current aims, as Australia's landscape is not really suited for things like this, but if it were possible, then that's something we'd look at very seriously.

'My personal view is that data and information wants to be free. I'm trying to find a way to get people in touch with information as easily as possible. There are numerous other groups with similar aims in Australia, and as we all aim for similar goals, it would be awesome to interconnect at one stage.'

The ins and outs of 802.11

In 1990 the IEEE 802 Executive Committee created a work group to create standards in wireless local area networking (WLAN). The group called the technology 802.11, which operated under the 2.4GHz radio band – a free, unlicensed frequency in many countries. The group reached transfer speeds of 1-2Mb/s, and later began working on two more extensions to the technology, pushing the 802.11 standard much harder. 802.11b, which reaches speeds of 11Mb/s, runs on the 2.4GHz band. 802.11a, the other protocol later developed by the group, runs on the 5.2GHz band and rattles up speeds of around 54Mb/s. The first wave of (costly) 802.11a products hit the market only very recently (Autumn-2002).

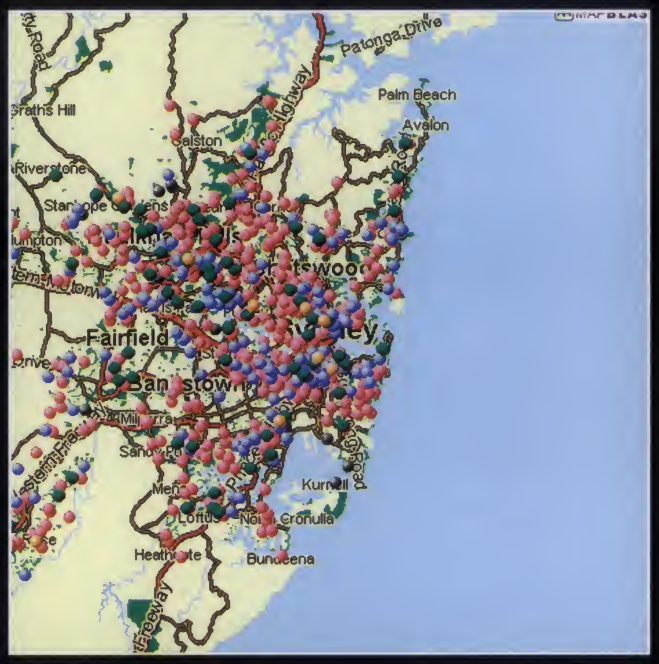
The benefits of the 802.11a technology are not only its large increases in speed, but, given that the 5GHz radio band is a newly licensed band, there won't be as many applications competing with each other for space. The 2.4GHz spectrum suffers from interference from wireless phones, microwave ovens, and the other major wireless technology, namely Bluetooth.

So why isn't everyone jumping on the 802.11a bandwagon? Apart from the extra cost, 802.11a comes with a few more hurdles: the most significant being that the dishes require more power to communicate as the protocol uses a higher spectrum (5Ghz). Current Australian regulations limit the amount of power transmitted to only 1 watt in the 5GHz band, and therefore 802.11a is quite limited over long distances compared with its 802.11b cousin (4 watt).

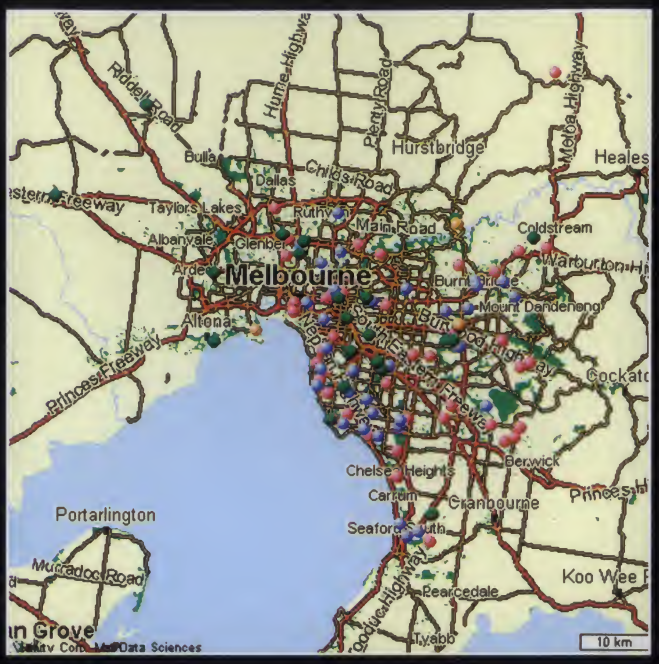
There is, however, a new standard on the horizon: 802.11g, which is currently being worked on by the IEEE. By using the common 2.4GHz spectrum, it will deliver speeds of up to 22Mb/s, which is around twice the speed of the common 802.11b standard. This new technology will deliver increased security and be backward compatible with all previous 802.11b chips, so they can be used in conjunction with the many wireless access points already installed. The Intersil Corporation has already announced it has developed the first network card based on 802.11g, and expects the card to be stores by the third quarter of this year.

Setting up a 802.11b network

While it is possible to set up a network using old Milo cans and Pringle containers, you'll be more successful with conventional network technology – in this case, you'll need to install an 802.11b card to access the network. These particular cards vary in price and quality, but you should be able to buy a decent card for under $200. Only five years ago you would have been looking at forking out $20,000 for one of the wireless systems on the market at the time. Choose a dish/antenna with as much power as you can afford. If you are strapped for cash and you're not scared of soldering irons, it is possible to use an old Galaxy/Austar dish to do your dirty work. Once you have the right gear, you should find the connection process as simple as emailing the organizer of the network to ask them where to point your dish, and retrieving your assigned IP. Hell, you could probably walk down to their place and ask – as long as the dish has a good line-of-sight to the other receiver, you should be fine. Trees, hills, and other houses can very easily play havoc with the signal, so you should contact your local Council and ask from ▷



ABOVE: Sydney's wireless coverage is massive and growing rapidly



ABOVE: As is Melbourne's. Coverage can only increase in time

Map pics from www.nodedb.com/nodedbs. Used with permission.

Carrier licences

Providing Internet access to the public via wireless may require an expensive carrier licence, depending on how you choose to go about it. At the moment, carrier licences are a touchy subject in the Australian 802.11 community, and hover around a difficult grey area. Paul Slocum from the Australian Communications Authority explains:

'Under the Telecommunications Act 1997, a wireless community network, which operates on a non-commercial basis, does not require a carrier licence. If, however, a community network provides Internet access to its members on a commercial basis then it does require a carrier licence. The determination of what constitutes a commercial offering is determined on a case by case basis.

'The requirement for licencing where commercial services are offered flows from the requirements of the Act and is not simply a matter of ACA policy.'

At present, there are wireless mesh groups in Australia who do offer their members outside Internet access, and have been doing so without problems (now finding an appropriate ISP to connect to is another story).

If you are planning on setting up a mesh with Internet access, make sure you check with the ACA (and your ISP) before going live.

them to be removed. Or not. Once everything is in place, you should have a permanent connection with access to any public server on the network, such as FTP, WWW, IRC, game servers, and so on.

Legal issues

Unsurprisingly, Australia has some fairly tight wireless laws in place, compared to countries such as the USA or Britain. Anyone wishing to connect to the actual Internet though a community mesh is out of luck: most mesh organizers are unable to single-handedly foot the bill for the costly carrier license required to provide Internet access over a distance.

But don't lose hope: at the time of writing, there was a Government inquiry into wireless laws, with an announcement expected soon. Insiders are optimistic the laws regarding carrier licenses will be revised to better suit the emerging wireless industry.

If 802.11 is to be successfully taken up in Australia, its future depends on how the Government will regulate the technology. Steven Haigh from Melbourne Wireless talks about the Government's role in 802.11:

'We're trying to get people online, but I think that the main hurdles we still hit are cost and legality. Once we get the legal aspects out of the way, then I think things will start to sort themselves out.'

Wireless should make some important progress over the next couple of years as laws governing its use are refined and the technology advances. 802.11 coverage will also be increased greatly:

'I'm aiming for total coverage of main areas [around Melbourne].

'Things will change a lot in the next five years. PCs will get smaller and faster, and wireless is still in its very early stages at the moment.

'There will be a lot of changes in wireless technology, but getting something going now helps us prepare for future advances.'

Additional Links

- www.xtreme.com.au/
- www.sydneywireless.com/
- www.wireless.org.au/
- www.itee.uq.edu.au/~mesh/
- www.xtreme.com.au/
- www.australianwireless.org/

[Tech note: 802.11g is spec'd at 22Mb, not at 54Mb, as most people conceive it to be. This is because of more spectrum available in the 5GHz range, 350MHz to be exact, compared with only 66MHz in most countries in the 2.4GHz range.

802.11b currently uses 22MHz to achieve 11Mb (with radio overhead this is closer to 6-8Mb); 802.11g uses 30MHz to achieve 22Mb, which means an overall gain of about 11Mb.

ie. 3x11 = 66Mhz and 33Mbits.

2x22 = 60Mhz and 44Mbits. . .] O

Ascending New Visual Heights

Xabre

Leave competitors in the dust with Xabre's powerful 8X8 graphics capabilities and world domination may soon be yours

Xabre's cutting-edge 8X8 graphics engine is a successful marriage between AGP8X and DirectX8.1 technologies. The latest AGP8X interface resolves transmission bottlenecks between existing graphics chips and the North and Southbridge, while Microsoft's DirectX8.1 gives you greater image performance for gaming and 3D graphics emulation.

- 8X8 Full driving Power GPU
- Pixelizer™ Engine
- Frictionless Memory Control™ (FMC)
- Jitter-Free Anti-Aliasing
- Coloredeemer™ Technology
- MotionFixing™ Video processor
- The Xminator™ XP Unified Driver
- CubicLook™ Utility
- Double Scene™ Technology

www.xabre.com

Hard wearin' – Computex 2002

Bennett Ring represented *Atomic* at the annual Asian pilgrimage to all that is Silicon. The year ahead of new tech was on show in all its hardware glory.

Trends

The following are some of the other key technologies that we believe are going to continue to grow in popularity over the next year, based on their presence at Computex:

1.) LCD TFT monitors
2.) VIA KT333 and KT400 motherboards
3.) Tablet devices
4.) PDAs

ABOVE: A fraction of the 500 or so stands that were in Hall 1 at Computex

Taiwan: the Asian hotspot of skateboarding dogs, scooters and of course, computer hardware. If you're not sure what we mean by the first two comments, check out some of the photos attached to this article. And if you're not sure about the last comment, just read the 'Made in Taiwan' sticker attached to most pieces of hardware and you'll soon get a good idea of just how prolific Taiwan's hardware industry is. Thanks to its abundance of cheap labour, a pro-IT Government and a glut of Engineering graduates, Taiwan has risen to become one of the leading manufacturers of IT hardware in the world.

Once a year Taiwan is home to Computex: one of the largest annual hardware expos – the stuff computer geek's wet dreams are made of. It's run by CETRA, a Chinese Government trade organization, with a focus on new IT products that buyers from around the world might be interested in purchasing.

It also happens to be absolutely packed wall to wall with the latest and greatest in PC hardware.

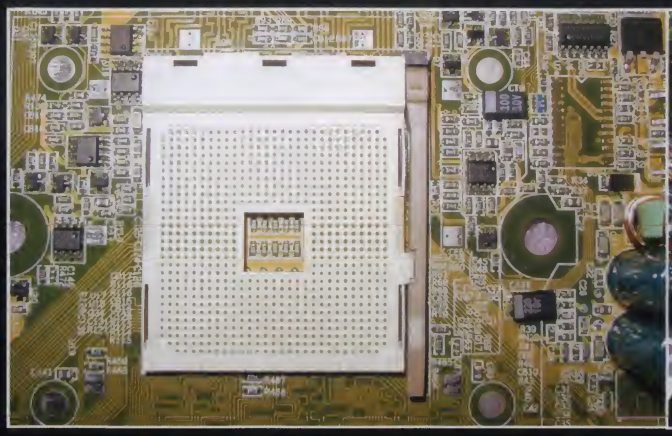
After the Neon extravaganza that was E3 in Los Angeles, Computex was much more subdued and business-like, with more of a focus on profit as opposed to fun. That's not to say that there weren't booth babes, it's just that the Computex girls tended not to dress like your average Barbarian crack whore.

While the stands were more low-key than those at E3, the number of attendees proved to be the opposite. Thanks to the organisers allowing plebs from the general public to attend, Computex was chock full of people hoping to scavenge branded pens, blow up hammers and free T-shirts. Thanks to the hordes of newbies, getting from one side of Hall 1, the largest of the conference halls, to the other would often take 30 minutes or more. Oh what fun.

After getting used to the crowds without going totally postal, we finally managed to start looking at the scrumptious hardware that was on display. Every major manufacturer, be it of video cards, motherboards, chipsets, hard drives or any other component you can think of, had a stand at the show. It's just a pity that there weren't too many innovative products – most of the manufacturers had basically identical products to every other manufacturer. I guess that's what you get when products are all based around a select few chipsets.

If there was one thing that grabbed our attention by the gonads and wouldn't let go, it had to be AMD's new x86-64 processor, the K8, *aka* the Opteron. But we'll tell you more about that over the page.

Other than this, the most interesting products on display were at the chipset manufacturers' stands, such as ALI, VIA, SiS and NVIDIA. But again, these products weren't really revolutionary, rather, they



ABOVE: The socket 754 interface for AMD's K8

ABOVE: No, this isn't a scooter dealership – it's the Computex carpark

were evolutions of their current chipsets, with a few more features and slightly higher bus speeds tacked on. Every man and his dog displayed a motherboard chipset with USB2 and FireWire support, while integrated BlueTooth seemed almost as prolific. And if higher AGP speeds tweak your dials, 8X support looks to be the standard on every new chipset. But judging by the lack of a performance increase when AGP jumped from 2X to 4X, we're not exactly excited about the move to 8X. Thankfully this standard is going to be backwards compatible with lower AGP speed cards, so you won't need to get a new video card if you happen to purchase an 8X AGP motherboard. While we did see a lot of products that were similar to each other, visiting Computex clearly indicated future trends in PC hardware. Which were. . .

AMD K8 Opteron

AMD's demonstration of its new x86-64 based CPU, known as the K8 or Opteron, was easily the most exciting event at Computex. If you haven't heard of this chip, here's a little background: instead of ditching the 32-bit x86 architecture entirely to move to a 64-bit architecture, as Intel did with its low selling Itanium, AMD has revamped the existing x86 architecture to support 64-bit computing. This means that the K8 is still compatible with existing 32-bit applications, although from the rumours we heard at Computex the current samples aren't as fast at running 32-bit apps as the current Athlon.

It must be remembered that this CPU isn't due to ship until September, so hopefully a bit of the old optimising wizardry will sort this out.

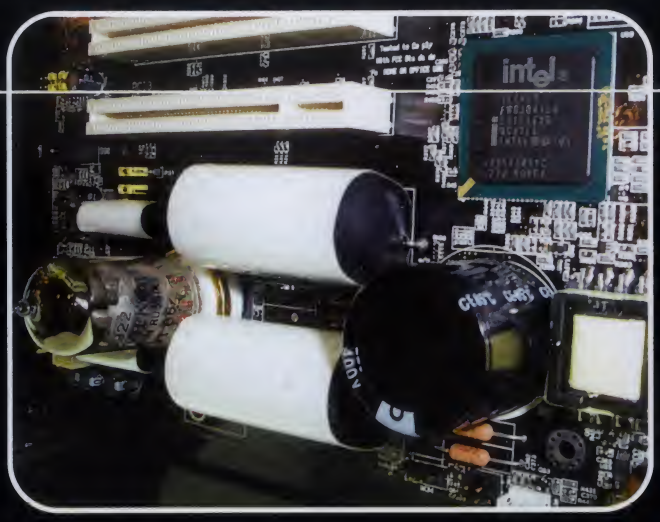
To support this new CPU, both VIA and AMD are releasing K8 compatible chipsets. VIA's K8 Northbridge is known as the K8HTA, and will be paired up with the BT8235 Soutbridge, which supports four USB2 ports, 8X AGP and FireWire. AMD's K8 Northbridge is the AMD8151, which will be paired up with its new 8111 Southbridge, although we did see a couple of boards using an AMD Northbridge and an ALI Southbridge, due to ALI's use of HyperTransport technology to link its new Northbridge and Southbridge chips. Speaking of ALI, it will also be releasing a K8 chipset, using the M1687 Northbridge and M1563 Southbridge. You won't be seeing any AMD/VIA hybrids, as VIA's V-Link technology is not compatible with AMD's HyperTransport.

We discovered a couple of interesting titbits regarding the K8's built-in memory controller: according to most motherboard manufacturers, you should still be able to overclock via the front side bus, which was in doubt due to the built-in memory controller. Slightly worrying is the knowledge you can only run a meagre two banks of memory with the K8, so if you see a K8 motherboard with more than two DIMM slots you know that some of these will be sharing banks.

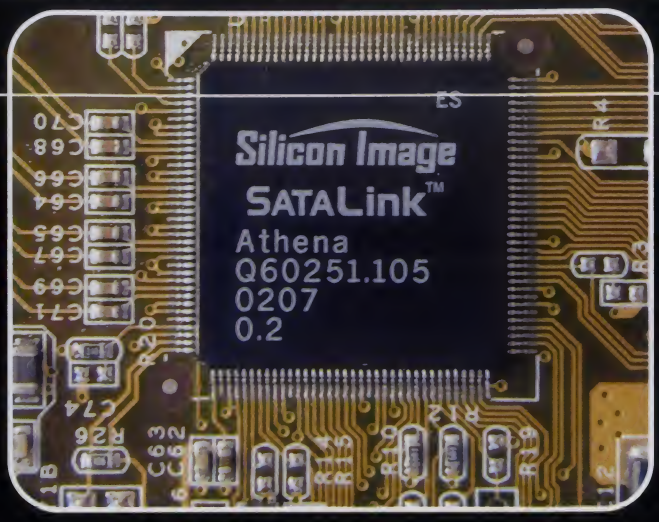
At the moment most motherboard manufacturers only have 800MHz samples of the K8, and benchmarking has been prohibited by AMD. You can expect the K8 to hit shelves around September of this year, with a focus on the workstation and server environments reflecting the high price it's bound to be selling for.

ABOVE: Spot the skateboarding dog – yes, weird indeed

ABOVE: Intel's world famous wall of motherboards



ABOVE: The revolutionary AOpen AX4B-533Tube's audio components



ABOVE: Serial ATA was one of the most prominent new techs on display

Serial ATA

It appears that if your company's new motherboards didn't support Serial ATA, you might as well start making rubber sex toys instead of mobos. While every motherboard manufacturer you can think of had a Serial ATA motherboard on display, only one company, DFI, actually had a real Serial ATA drive hooked up to its motherboard. DFI was using a Fujitsu drive, which was apparently incredibly difficult to get hold of. So while SATA controllers are a dime a dozen, it appears that the actual SATA drives are as rare as. . .

We saw three manufacturers of Serial ATA controllers; Promise (www.promise.com), Silicon Image (www.siimage.com) and Marvel. Surprisingly Promise didn't appear to be the number one Serial ATA provider – instead Silicon Image's controllers looked to be the SATA controllers of choice. While each of these three companies' controllers are all running at a peak of 150MB/s, the average transfer speed is very close to the 150MB/s mark, as opposed to ATA133, which averages closer to 110MB/s. The next generation of SATA controllers will run at 300MB/s, which will leave the IDE interface eating its pixie dust.

For those who don't want to purchase an entirely new motherboard, you'll be glad to hear that there will be a huge range of add-in PCI Serial ATA cards, and their performance promises to be as good as, if not better than, the integrated controllers.

USB2

There's a new peripheral interface in town, and it's getting ready to blast the others away, both in terms of performance and pricing. OK, it's not exactly brand new, but the next generation of motherboard chipsets ALL support USB2, with some chipsets supporting a maximum of 10 USB2 ports!

To go with the gamut of new USB2 compatible Southbridges, a wide range of peripherals was on show that made use of the new connection. The vast majority of these were external drives, be it DVD, CD-ROM or CD-R/W, all of which will notice a massive performance increase by the 400Mb/s of bandwidth offered by USB2. Repeat after me: 'Goodbye FireWire, Hello USB2, Goodbye FireWire...'

Vacuum Tube technology

We had to change our boxers after viewing four SMP'd K8s running a 64-bit .Net server, but our spooge containers were emptied yet again when we stumbled upon an AOpen board that looked to be a hybrid of 1960s technology with today's highest of high tech mobos. Some boffin in AOpen's R&D department realised that the best way to get high quality, warmer and fleshier sound out of your motherboard is to use a vacuum tube combined with a couple of high-end audio grade capacitors. According to the AOpen representative who demonstrated the board, you'd need to spend around US$500 to get an amplifier with similar quality sound output.

After hearing the motherboard in action, hooked up directly to a pair of audiophile quality speakers WITHOUT the use of an amplifier, we have to agree that the sound quality from this motherboard is up there with that of a high-end hi-fi. An onboard AC'97 sound chip supplies 5.1 channel sound to the pre-amp, and surprisingly doesn't let the amazing amplifier performance down. The motherboard is the i845E based AX4B-533Tube, and you can expect an Atomic review of this revolutionary motherboard within the next couple of issues.

New Intel chipsets

Approximately one month before Computex, Intel announced four new motherboard chipsets, to be used in conjunction with the new 533MHz FSB Pentium 4 or 400MHz FSB P4-based Celeron. Four variants of this were announced: the i845G with a 533MHz FSB and new Intel integrated graphics; the i845G/L with the same integrated graphics and a 400MHz FSB for use with the new Celeron; the i845E, the intended performance chipset that has a 533MHz FSB but forgoes the integrated graphics; and the i850E, which brings the new 533MHz FSB to users who prefer to pay highly inflated prices for RDRAM. Every motherboard manufacturer you can think of is releasing a motherboard based on these chipsets, most of which also incorporate a Serial ATA controller.

Amongst all of these basically identical motherboards, Gigabyte's i850E board stood head and shoulders above the rest. This is because Gigabyte has managed to pair up the i850E Northbridge with the new all-singing, all-dancing ICH4 Southbridge, something even Intel hasn't managed to do. Which is something Gigabyte is pretty proud of. So if you're looking for the ultimate Pentium 4 motherboard, and managed to nick some RDRAM from your design department's workstations when your manager wasn't looking, the Gigabyte GA-8IHXP is the motherboard to own.

Working with some of the most unique and technologically advanced equipment and avionics systems in Australia will get your Aircrew or Engineering career off to a flying start. What's more, you'll get great pay even while you're training to become an officer. To be eligible for entry, you must be at least 17 years of age (additional age guidelines apply), and meet Air Force entry requirements. Start your career at the top and call the Air Force now on **13 19 01**

or visit **www.defencejobs.gov.au**

AIR FORCE

ABOVE AND BEYOND

RPM
CPU
PC
RPM
CPU
PC TACHOMETER

REVIEWS

More RAM than sense

64-bit computing offers many advantages over 32-bit tech, but Bennett Ring discovers the hidden cost of one of its main benefits.

Intel's Itanium processor hasn't been selling too well, in fact some might be tempted to call the launch of Intel's first 64-bit processor a total flop. Yet Intel realised that the launch of Itanium was always going to be a bit of an uphill struggle. You see, it's very hard to ship hardware when there is a limited amount of software to run on said hardware. And yet, like the old chicken and egg dilemma, software won't be developed unless there is hardware that can use it.

So Intel has copped it on the chin with the release of the first Itanium processor, in the hopes that software developers would begin to develop more applications once a widespread 64-bit solution became a reality.

We recently attended a press briefing for the launch of Itanium 2, yet the focus of the meeting wasn't on the new, beefier processor; instead the message Intel seemed to be pushing was that there is now an adequate level of software support for the Enterprise market to seriously start considering the use of 64-bit applications.

The biggest area that Intel perceives as benefiting from the use of its 64-bit solution is the database arena. The Itanium's ability to directly address up to 1Petabyte (1,024 Terabytes) of memory, as opposed to the meagre four Gigabytes of memory that today's current 32-bit processors can directly address, has the potential to give database performance a massive shot in the arm, and is one of the key features that Intel is pushing in regards to the Itanium 2. Instead of having to use relatively sluggish hard drives to store the database information, the entire database can now be stored within the system's directly accessible memory, making searching, reading and writing exponentially faster. But it appears that Intel has forgotten one thing – the exorbitant cost of memory compared to that of hard drives.

Consider this: if you were running a server with a 150GB database, you would need 300GB of hard drive space, after taking mirroring into consideration. Basing this storage around 7,200RPM SCSI drives such as Seagate's Barracuda 180 68-pin 181GB drive, with one Adaptec 29160 SCSI controller card, the total cost of storage using today's prices will be approximately $7,200. Compare this to the cost of 150GB of server quality DDR-RAM. If you were to use Kingmax 266MHz ECC DDR-RAM, 150GB is going to cost you approximately $120,000 – that's almost seventeen times as costly as the hard drive based server. You don't even want to consider how much more expensive it would cost to run a full Petabyte of memory when compared to hard drives, if it were physically possible on a single system.

While it's all fine and dandy to promote the performance gains of using memory over hard drives to store your database, as we can see the increased costs are going to be a prohibitive factor for many. Is it really worth paying up to seventeen times as much just so your customers' reports and forms are generated a few seconds faster?

So it looks as if one of the main benefits of using an Intel Itanium 2 leads to costs that will no doubt deter a large portion of the market. However, solid state memory prices are continuing to plummet, so the story might be very different within a couple of years.

Other than this hurdle, Itanium 2 is shaping up to be an impressive processor. Intel showed us many 'projected' benchmarks (which should be taken with a grain of salt until we see real world benchmarks) that place it up to 1.5 times faster than the current Itanium in certain situations, and a whole lot faster than competitors' current 64-bit systems. Perhaps the biggest influences upon this speed boost are the increased amount of onboard cache, which rises to a massive 3MB, and the use of 266MHz DDR-RAM instead of the SD-RAM paired with the original.

With the release of AMD's Opteron towards the end of this year, the choice of affordable 64-bit server and workstation systems is going to skyrocket, giving established 64-bit manufacturers such as Sun and HP some serious competition. It also means that the trickling down of 64-bit technology to the desktop can't be too far off.

Last month *Atomic* covered the technology that is driving Matrox's newest GPU, Parhelia. While we're still waiting for our review sample to show up, benchmarks have now been popping up all over the Net, and we're sad to say that it appears NVIDIA, and even ATI, don't have anything to worry about. Without Anti-Aliasing enabled, the Parhelia is getting thoroughly trounced in every benchmark, at every resolution. It appears that its whopping 18GB/s of memory bandwidth isn't providing the performance at high resolutions that we expected. Whether this is due to immature drivers or the unexpectedly low clock speed that the Parhelia has shipped at (with its 220MHz core and 550MHz memory bandwidth on the faster retail version) has not been determined. We're hoping that by the time we receive our review sample some of the kinks in Parhelia's drivers will have been ironed out, giving us a better idea of its maximum performance compared to the thousand and one online reviews that sprung up the day the NDA was lifted, all of which used the immature driver set.

One thing that every Website has raved about is Parhelia's Fragment Anti-Aliasing, claiming that the visual quality surpasses both ATI's and NVIDIA's full scene Anti-Aliasing, with much less of a performance hit. Needless to say, everyone in the *Atomic* labs is quivering in anticipation of getting our mitts on the Parhelia, and you can be sure we'll be attacking it from angles others didn't have the time or inspiration to do.

Atomic Benchmarks

The way we do the things we do.

Here at *Atomic* it is our primary intention to give you the final word on the latest in hardware and PC technology. An integral part of determining the performance of a particular piece of hardware is benchmarking, and this is something that we take very seriously in the *Atomic* Labs.

SYSmark2002

SYSmark is a product of the collaboration between industry group BAPCo (www.bapco.com) and MadOnion.com (www.madonion.com). It is one of the next-generation application benchmarks and is designed to more accurately replicate the day-to-day workload that a system is subjected to. The benchmark focuses on Internet Content Creation and Office Productivity tasks in order to generate a final rating.

SiSoftware Sandra 2002 Professional

Sandra, from SiSoftware (www.sisoftware.co.uk), is a comprehensive benchmark and diagnostics utility. It contains dozens of special module applets that retrieve detailed information about the specifications and settings of a system, by polling each component's built-in firmware or BIOS. Sandra also features a small suite of synthetic benchmarks for specific components such as CPU, memory, CD-ROM and hard disk. It also features a burn-in wizard for stress-testing overclocked systems.

3DMark2001SE Pro

3DMark2001SE Pro from MadOnion.com is the next progression of the popular benchmark utility. It also uses the MAX-FX engine and heavily emphasises DirectX 8.1 functions, including programmable shaders. The results are not comparable with results from 3DMark2000 Pro.

Serious Sam: SE

Serious Sam: The Second Encounter is used for testing OpenGL performance. For game tests we use the Cooperative demo, which outputs an average framerate trimmed of excessive peaks. It also contains a fillrate test, which outputs fillrates for various texturing methods and is useful for comparisons between video chipsets.

HSF testing

To test HSFs, we use our Athlon XP test bed, which uses an internal temperature diode. SiSoft Sandra 2002 is run in looping burn in mode, with both CPU tests selected for 30 minutes before the load temperature is recorded. The CPU is then left to idle for 30 minutes before the idle temperature is taken.

Quake 3: Arena AtomicMPC Demo

Quake 3: Arena (Q3A), from id Software, is the very popular first person shooter representing widely used OpenGL gaming technology. Q3A has a built-in benchmarking utility and built-in demos that can test graphics card performance. These demos are fairly simplistic, and are not representative of the worst conditions that the game can offer to a graphics card. So we developed our own *AtomicMPC* Demo that pushes the hardware as far as possible.

Other benchmarks

Sometimes we need to break down the tests into more specific areas, such as hard disk performance, memory performance or a particular facet of 3D like T&L. For these specific purposes we can draw on a vast number of applications, games and dedicated benchmarks such as CD Speed 99, DisplayMate, Dronez, MDK2, or Adaptec ThreadMark. We also use a Lian Li temperature probe from Anyware (www.anyware.com.au) for tests that involve the measurement of temperatures, such as HD heatsinks.

Atomic testbench specs

Both systems are running Windows XP Professional with DirectX 8.1, as well as the latest official NVIDIA drivers.

- **AMD Athlon XP 1800+ system – ASUS A7V266-E motherboard (supplied by CASSA:** www.cassa.com.au)
- **Intel Pentium 4 2GHz – ABIT BD7II-RAID motherboard (supplied by ABIT:** www.abit.com.tw)

Common components

- **Samsung 256MB PC2700 DDR RAM (supplied by CASSA)**
- **Samsung 256MB PC800 RDRAM (supplied by CASSA)**
- **Hercules Prophet II GTS 32MB (supplied by Guillemot:** http://au.hercules.com)
- **20GB Ultra DMA/100 7,200rpm hard disk drive**
- **Hercules Prophet II GTS 32MB (Supplied by Guillemot:** www.hercules.com)
- **Sound Blaster Live! Player (Supplied by Creative Labs Australia:** www.creaf.com)
- **ASUS 52X CD-ROM (supplied by CASSA)**
- **Belkin PCI FireWire card (supplied by Belkin:** www.belkin.com.au)
- **Belkin PCI USB 2.0 card (supplied by Belkin)**

Benchmark settings

3DMark2001SE Pro

- **1,024 x 768, 16-bit colour, 16-bit textures, 16-bit Z-buffer, triple frame buffer**
- **1,024 x 768, 32-bit colour, 32-bit textures, 24-bit Z-buffer, triple frame buffer**
- **1,600 x 1,200, 16-bit colour, 16-bit textures, 16-bit Z-buffer, triple frame buffer**
- **1,600 x 1,200, 32-bit colour, 32-bit textures, 24-bit Z-buffer, triple frame buffer**

Quake 3: Arena AtomicMPC Demo

All tests use Quake 3 1.27g and our custom Q3A demo recorded by the *Atomic* staff

- **CPU testing: 320 x 240, maximum geometry detail, minimum graphics settings, high sound quality**
- **Graphics cards: Low quality =1,024 x 768, normal quality graphics settings, sound disabled**
- **Medium = 1,280 x 1,024, maximum graphics settings, with all game sound disabled**
- **High = 1,600 x 1,200, maximum graphics settings, sound disabled**

Remember the first .....?

Flexscan L685
*Available in Grey as shown or Black.

EYES LOVE EIZO™

www.eizo.com.au

tel: 1800 705 060

Do you remember your first kiss? Do you remember who produced the first CD Player or the first vacuum cleaner?

Of course you do! First is important. It is distinctive. First changes everything that follows. Do you remember your second kiss or the producer of the second vacuum cleaner? Well? ..... thought so.

EIZO have brought many "firsts" to the monitor market in the area of technical design and innovation. For example, in 1998 EIZO were the first manufacturer to release 18" LCD's and today most major finance houses utilise them. Now EIZO have released not 1 but 3 firsts.

1. Eizo was the first to produce an 18" LCD monitor with a bezel under 20mm wide. Check out the new 18" thin bezel L685 shown above.
2. The L771 was the first 19.6", 1600x1200 resolution LCD.
3. The L461 was the first new generation 16", 1280x1024 LCD monitor.

Don't settle for second best, second isn't here yet.

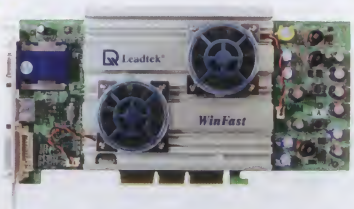
EIZO®

Framerate

Framerate features the latest in CPUs and video cards, benchmarked and compared. Each month we will add to the list, so when it comes to you choosing your next upgrade you have all the info you need, right here.

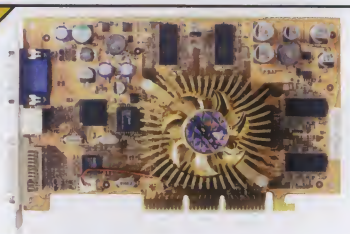
ABIT Siluro GeForce4 Ti4600

Specifications: NVIDIA GeForce4 Ti4600; 128MB DDR RAM; TV Out; D-Sub; DVI.
Core speed: 300MHz **Memory speed:** 650MHz
Website: ABIT www.abit.com.tw
Supplier: Synnex www.synnex.com.au
Price: $699



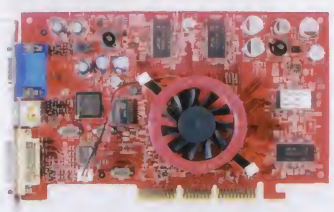
Leadtek Winfast A250-TD

Specifications: NVIDIA GeForce4 Ti4400; 128MB DDR RAM; TV Out; D-Sub.
Core speed: 275MHz **Memory speed:** 550MHz
Website: Leadtek www.leadtek.com
Supplier: BCN Technology www.bcntech.com.au
Price: $759



Prolink Pixelview GeForce4 Ti4200 128MB

Specifications: NVIDIA GeForce4 Ti4200; 128MB DDR RAM; TV Out; D-Sub.
Core speed: 250MHz **Memory speed:** 444MHz
Website: Prolink www.prolink.com.tw
Supplier: Checksun www.checksun.com.au
Price: $499

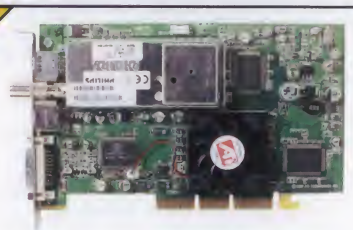


Gainward GeForce4 PowerPack! Ultra/650TV Golden Sample

Specifications: NVIDIA GeForce4 Ti4200; 128MB DDR RAM; TV Out; D-Sub.
Core speed: 250MHz **Memory speed:** 444MHz
Website: Gainward www.gainward.com.tw
Supplier: PC Range www.pcrange.biz
Price: $399

VisionTek Xstacy GeForce4 Ti4400

Specifications: NVIDIA GeForce4 Ti4400; 128MB DDR RAM; TV Out; D-Sub.
Core speed: 275MHz **Memory speed:** 550MHz
Website: VisionTek www.visiontek.com
Supplier: Innovision www.innovision.com.au
Price: $749

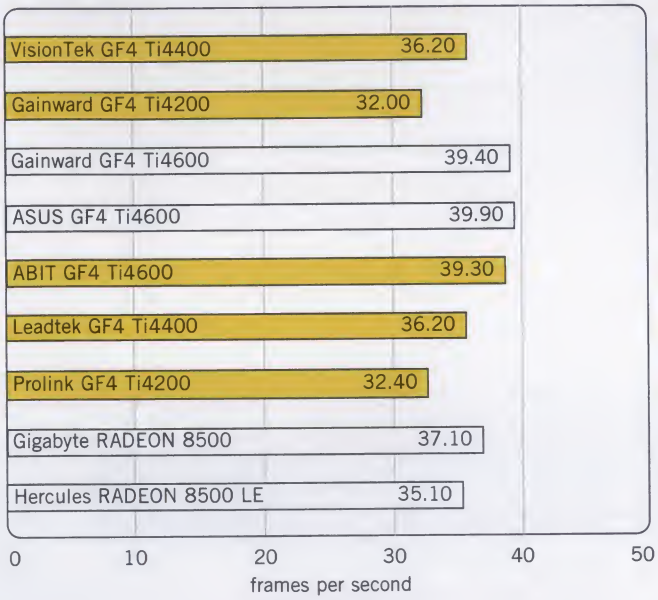


3D Prophet ALL-IN-WONDER 7500

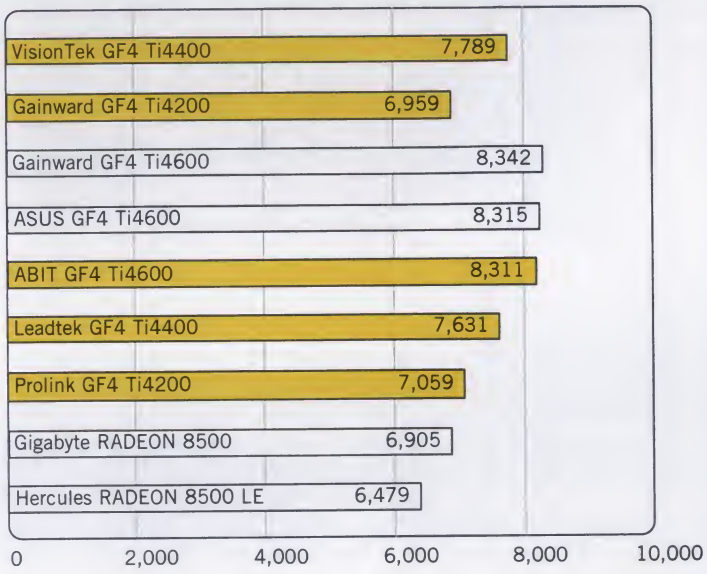
Specifications: ATI RADEON 7500; 64MB DDR RAM; Stereo TV Tuner; video editing studio.
Core speed: 260MHz **Memory speed:** 360MHz
Website: Hercules au.Hercules.com
Supplier: Hercules au.Hercules.com
Price: $460

Pentium 4 2.4B GHz	Pentium 4 2.53GHz
Specifications: 0.13-micron process; 533MHz FSB; 8KB L1 Cache; 512KB L2 Cache. **Speed:** 2.4GHz **Website:** www.intel.com	**Specifications:** 0.13-micron process; 533MHz FSB; 8KB L1 Cache; 512KB L2 Cache. **Speed:** 2.53GHz **Website:** www.intel.com

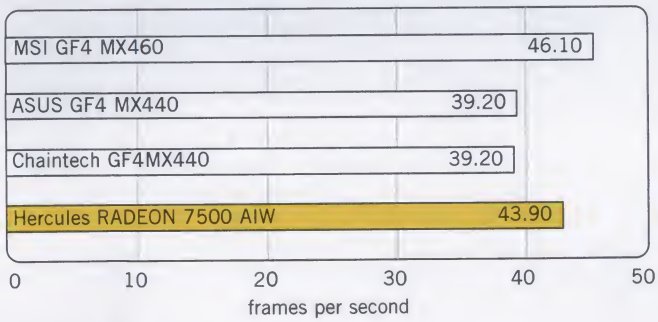
Serious Sam SE – 1,280 x 1,024



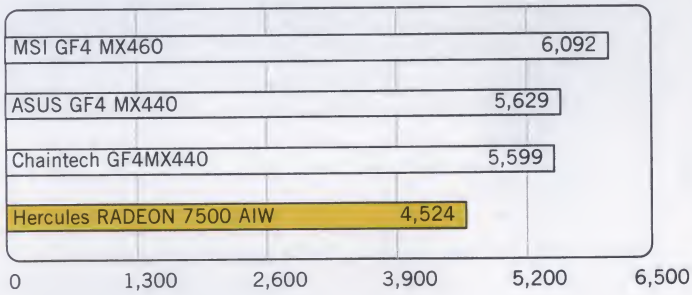
3DMark2001 – 1,280 x 1,024



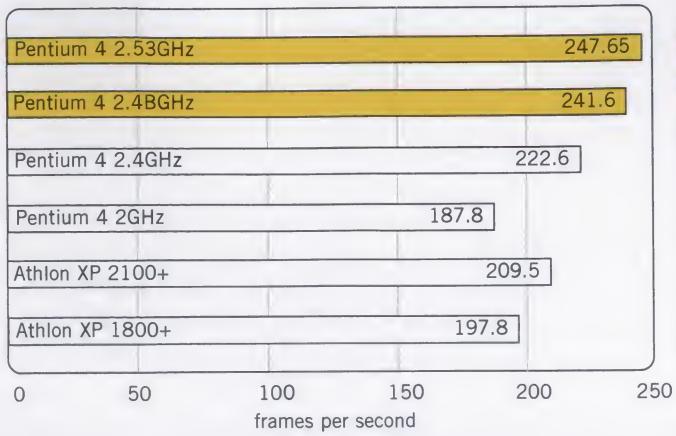
Serious Sam SE – 1,024 x 768



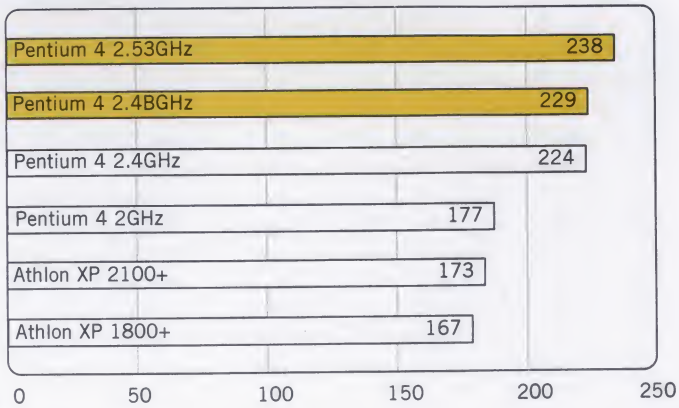
3DMark2001 SE – 1,024 x 768



Quake 3: Arena

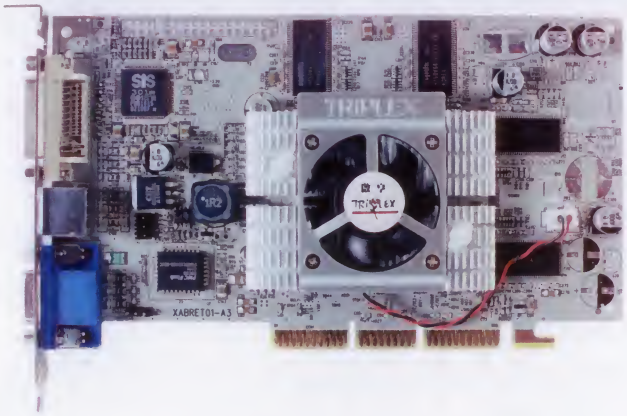


SYSmark2002



Triplex Xabre400

John Gillooly checks out Triplex's sweet little SiS-ter.



The GeForce2 MX stands as probably the most successful 3D chipset of recent years, something that NVIDIA has been unable to replicate with the GeForce2 MX Ultra, oops . . . I mean the GeForce4 MX series. These cards are speedy enough, but they lack the increasingly important DirectX 8 compliance. In fact, there has been no real DirectX 8 compliance in the budget card range – until now. This compliance has come from the most unlikely of corners: former 'crappy mobo chipset' maker, SiS.

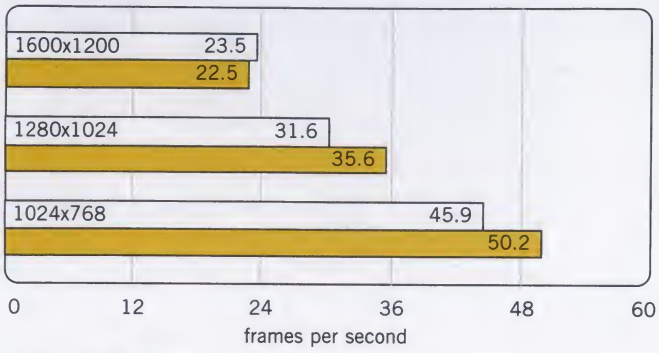
SiS has evolved significantly over the past year: it's motherboard chipsets have rapidly achieved respectability, and its video chipsets are following suit. The SiS315 chipset was decent quality, performing just below the level of the GeForce2 MX. With the next generation Xabre series of cards, SiS is now making people realise that it is a contender in the 3D world. Xabre features hardware Pixel shaders (unlike the GeForce4 MX chipset) and uses optimised CPU routines for vertex shading (like the GeForce4 MX chipset). The core of the performance level Xabre400 runs at 250MHz, with 128-bit DDR RAM running at an effective 500MHz.

What better way to debut a new chipset than with the introduction to the Australian market of a new video card manufacturer? Triplex is a Taiwan based company on the rise to video card stardom thanks to its natty silver PCBs. Production of these cards is not just a case of some poor sod having to spray paint each unit on its way out the factory door, but rather Triplex has developed a process for incorporating silver coloured metal into the PCB itself. This is supposed to help cooling, but the main advantage is that it looks so damn cool.

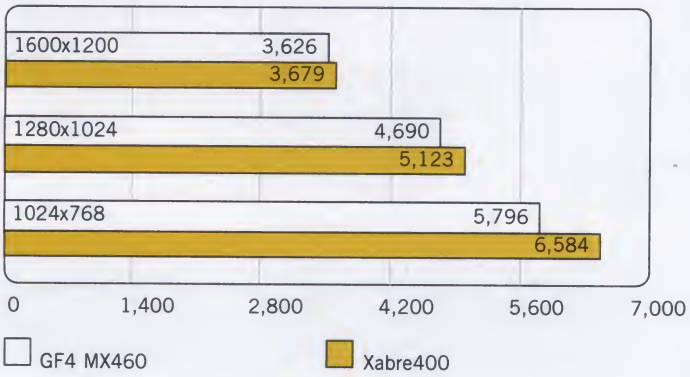
One 'feature' of early models of the Triplex Xabre400 and SiS Xabre400 reference cards was a strange clicking that came from one of the myriad components when the card was under load. It's slightly freaky when your video card is sounding like it is about to undergo some sort of nasty metamorphosis into a lump of useless silicon. Thankfully, Triplex seems to have done some hasty redesigning and all is quiet on the clicking front.

We tested the Xabre400 using 3DMark2001SE and Serious Sam: SE and compared the results to an MSI GeForce4 MX460. In 3DMark2001SE the Xabre performed admirably, staying well ahead of the X460 card at all resolutions. This performance gap peaks at 14% at 1024x768 and drops to only two percent at 1600x1200. When you consider that the

Serious Sam SE



3DMark2001SE



MX460 has less features and costs $50 more, then the gap is very interesting indeed.

In the Serious Sam tests, however, the Xabre shows the almost universal problem faced by a new chipset: compatibility issues. We ended up using an older driver for the Serious Sam benchmarks due to the fact that it refused to run under the newest SiS reference drivers. Using the older drivers, the Xabre still managed to stay 9% ahead of the MX460 at 1024x768, dropping to fractionally slower performance at 1600x1200.

For the price the Triplex Xabre400 is the best performer you can get, with a featureset that is attractive indeed. The major problem is that the Xabre chipset is still at the mercy of the SiS driver team. NVIDIA's budget range may be slower and lack features, but thanks to the popularity of the GeForce range, and the maturity of the Detonator Unified Drivers you are pretty much guaranteed that your games will work first time out on the cards.

Xabre will certainly have the competition rattled, but it is still very much a baby in the big bad world of 3D graphics, and teething problems are going to be inevitable.

SPECIFICATIONS

SiS Xabre400 GPU; 64MB 128-bit DDR RAM; AGP 2x/4x/8x support; D-Sub, DVI and S-Video TV-Outputs.
Website: Triplex www.triplex.com.tw
Supplier: AusPCMarket www.auspcmarket.com.au
Phone: AusPCMarket (02) 9817 2899 **Price:** $199.95

8/10

PixelView

Creating a New Vision!

GeForce4 Ti 4200

Experience the Ultra Fast Performance and Innovative Multi-display Technology

GeForce4 Ti 4600

GeForce4 Ti 4400

GeForce4 Ti 4200

Distributed by Checksun

High Resolution TV-Out / DVI

NVIDIA nView™ Display Technology

64 / 128 MB DDR

NVIDIA Lightspeed Memory Architecture II

NVIDIA Accuview™ Antialiasing

CHECKSUN

Checksun Australia Pty. Ltd
Century Estate
Unit 3, 476 Gardeners Road
Alexandria
NSW 2015

tel: (+61) 9317-3155
fax: (+61) 9317-5155

http://www.checksun.com.au

Checksun New Zealand Ltd
1016 Great South Road
Penrose
Auckland
New Zealand

tel: (+64) 9579 8838
fax: (+64) 9579 8832

http://www.checksun.co.nz

PROLINK
PROGRAPHIC IMAGE SHARPENER

www.prolink.com.tw

LEADING IN VGA & MULTIMEDIA

PC Tachometer

Since the boom of case modding over the last year or two, it's become much harder to find an original mod accessory to out-l337 all of your mates' furry, fluffy, painted, neon-laden cases. Due to the similarities between PC case modding and hot rodding, it was only a matter of time before we started seeing hot rod products, other than the ubiquitous neon light, being used on the PC. And what better way to show off the oomph of your machine than a tachometer?

This is exactly what the PC tachometer is: an automotive tachometer that has been modified to work with your PC. It uses a serial connection to hook up to any of your com ports, and also has a molex connector to supply the power. Installation was a simple affair: after plugging in both the serial and molex connector, the driver software was installed - all in about two minutes. If you're the type of gamer who likes to do it in the dark (play games that is), you'll appreciate the backlit display, although the globe within does make the tacho quite warm after a few minutes of use.

We fired up SiSoft Sandra's CPU benchmark to max out the tachometer, but unfortunately the unit didn't work with this program. However, it worked perfectly with every other application that we threw at it.

A small complaint about the device is that the maximum speed on the dial is 8,000RPMs, which signifies 100% CPU load. It would have been nice to have the top speed as 10,000RPM, but you soon get used to interpreting the displayed speed into a CPU load percentage.

We're not denying that the PC Tachometer is nothing more than a gimmick, and a fairly expensive one at that, but we also can't deny the fact that we fell in love with it the first time we saw it max out during a demo in 3DMark2001.

Put simply, there is an absolutely untouchable coolness about this gizmo that makes it a must have for any serious case modder.

SPECIFICATIONS

Automotive tachometer, serial connection for software and molex connector for power.

Website: Xoxide www.xoxide.com

Supplier: PC Case Gear www.pccasegear.com

Phone: PC Case Gear **Price:** $119

8.5/10

ABIT Media XP

In the past two issues we have had the joy of testing the motherboards that currently comprise ABIT's MAX series. These boards, the AT7 and IT7, lack those annoying PS2, serial and parallel ports that clutter up the rear of most cases, and add six channel onboard sound with optical out, USB 2.0, IEEE1394, onboard LAN and four channel ATA133 RAID, among other things. There are other MAX boards on the way, adding support for technologies such as Serial ATA, and ABIT remains committed to the strategy of legacy free mobos.

In order to expand the functionality of the MAX boards, ABIT has launched the Media XP expansion bay device. This sucker hooks onto various connectors on the MAX boards, sits in a spare 5.25in expansion bay, and adds two USB 2.0, one IEEE1394, speaker, headphone and optical SPDIF ports for easy access alongside readers for SD, Memory Stick and Compact Flash cards.

Similar devices have been available for a while from other motherboard manufacturers, however we have seen none that match the functionality of the Media XP. The technology behind such devices is simple: they connect via headers into USB (and in this case IEEE1394) channels on the motherboard.

The front panel for the Media XP is beige, and is designed so it will jut out of the front of the case by 1.5mm. For those of us who have non-beige cases, the design may be slightly tricky to repaint, but the faceplate does come off easily so you can spray away without damaging the delicate internals.

There will be few people who really need all three of the onboard readers, but the choice of SD, Memory Stick and Compact Flash means that anyone who uses the current generation of memory cards should find at least one of these invaluable; the inclusion of the USB 2.0 and IEEE1394 ports on the board is a bonus for anyone who is sick of reaching behind the case to plug and unplug their devices.

For the average overclocker though, the Media XP is pure luxury. The people that will get the most benefits from this device are those who are active users of digital cameras, MP3 players and other consumer electronics gismos.

This is an optional extra for MAX owners, but if the functionality is required then it's is a very nice addition indeed.

SPECIFICATIONS

USB 2.0, IEEE1394; optical SPDIF; SD, Memory Stick and Compact Flash readers; ABIT MAX motherboard needed.

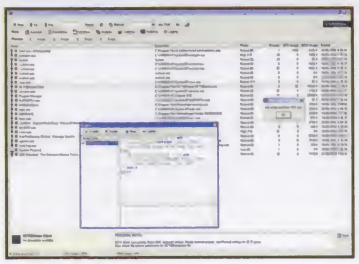
Website: ABIT www.abit.com.tw

Supplier: Synnex www.synnex.com.au

Phone: Synnex 1300 880 038 **Price:** NA

8/10

WinTasks 4 Professional



WinTasks is what Windows Task Manager should have been: a centralised interface giving granular control over the processes running on your system.

The main window of WinTasks displays all processes currently running, and for each process, WinTasks displays its name, whether it is critical to the functioning of Windows and the location of the executable responsible for spawning it; as well as process priority, threads per process, percentage of CPU and memory used, and date and time each process was started. Essentially a 'pretty' presentation of information available via Task Manager on NT-based operating systems. However, not all categories of information are available on all platforms – what's available is dependent on your version of Windows.

WinTasks has several sub-windows with different functions. An 'Autostart' sub-window takes information from registry and displays all executable files set to run on boot. It then allows you to add, remove, enable and disable different applications from this list. Although possible to do via RegEdit, WinTasks 4 simplifies it greatly.

The 'Windows' sub-window displays all windows owned by a particular process and their visibility. While you may see only one window on the desktop for the msmsgs.exe (Windows Messenger) process, checking the 'Windows' sub-window reveals msmgs.exe actually owns 10 windows, one of which actually visible. If you feel the need, you may toggle each window between visible and invisible, with some interesting results. A 'Modules' sub-window displays all DLL files used by a process, while a 'Statistics' sub-window displays CPU and memory use for your system over a time scale between one minute and 24 hours. If your OS is NT-based you'll be able to access memory and CPU usage statistics on a per process basis.

The 'Scripting' sub-window allows you to write custom scripts to trigger events based on the condition of a process. For example, you could write a script that stopped a process if it used more than 60% of CPU, 50% of memory and had the string 'Internet Exp' in its window title. This would terminate Internet Explorer every time it exceeded the specified values. Lastly we have the 'Logging' sub-window that displays a record of which processes were run, what executable ran them, and the date and time they were spawned.

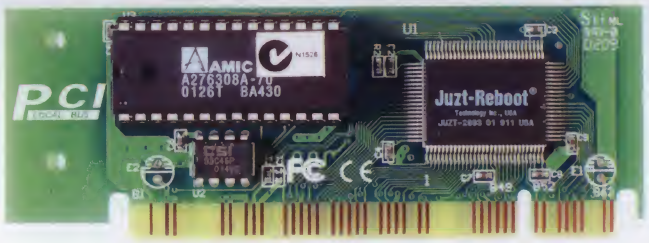
WinTasks 4 Professional is a useful but expensive tool for anyone running a Win9x-based operating system as it gives you more control over your OS than the End Task dialogue.

SPECIFICATIONS

Process autostart list; Module DLL listing; Scripting capabilities; Statistics and Logging features.
Website: Liutilitis www.liutilitis.com
Supplier: Liutilitis www.liutilitis.com
Price: Boxed cost: $US57,Download cost: $US47

6.5/10

Juzt-Reboot PCI-NT



If you've ever administrated systems accessible by multiple users, you're sure to know the time and troubles inherent in keeping them up and running. Entire systems will be frequently trashed, creating hours of work. Juzt-Reboot claims to protect you from all this. Install the Juzt-Reboot PCI card and forget about the system as Juzt-Reboot restores it to pristine condition on each restart.

Juzt-Reboot works by creating a partition at the end of the hard drive where it stores information about your system's configuration. At each boot, you choose either 'user' or 'supervisor' mode. In the password protected supervisor mode, Juzt-Reboot allows you to make changes to the computer that will persist after restarting. In user mode, the state of the C: drive is compared to Juzt-Reboot's recorded state and if changes are detected, the original configuration is restored.

To test Juzt-Reboot's claims, we deleted a bunch of files from the Windows directory. Thirty seconds later we rebooted the system only to find it stuck in a perpetual loop. It would get as far as detecting the boot device and then reset itself. Not a good sign.

On second attempt we discovered the first boot made to 'user' mode boots you into supervisor mode, which explains why we'd managed to kill the system originally. However, subsequent boots into user mode work correctly. After double-checking which mode we were in, we deleted more files and restarted. Juzt-Reboot detected changes and restored the missing files. It also managed to do the same when we killed power in the middle of multiple file deletions. Satisfied, it was time to test it with some evil viruses. We installed an assortment on the system, much to the horror of our Sys Admin, however Juzt-Reboot lived up to its claims once again by restoring the system. Lastly, we tested Juzt-Reboot's 'protection against format' claim. We booted with an XP CD and selected 'quick format NTFS'. After reboot, we were presented with the message 'NTLDR missing'. We'd killed the system.

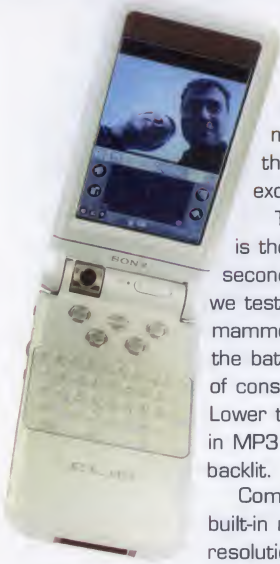
Juzt-Reboot is an ideal product for people who have multiple systems or multiple users as it will protect your machines from viruses, file deletions and other mishaps that tend to occur in these situations. Keep in mind however that Juzt-Reboot won't protect you from everything. Trashing a system with Juzt-Reboot installed is still possible, just harder.

SPECIFICATIONS

105mm x 35mm. Instant Recovery Mode supports Windows OSes. Backup Recovery Mode supports x86 compatible OSes.
Website: www.juzt-reboot.com
Supplier: Ado Electronic www.ado.com.au
Phone: Ado (02) 9417 5233 **Price:** $149

7/10

Sony PEG-NR70V CLIE



Like every product manufactured by Sony, the latest version of the CLIE is as much a fashion accessory as it is a PDA. It also happens to cram in more features than any other PDA on the market, with a couple of glaring exceptions.

The most obvious feature of this CLIE is the 320 x 480 backlit colour TFT, second only to the 640 x 480 PC-Ephone we tested a couple of months ago. This mammoth screen obviously chews through the battery life, giving a meagre four hours of constant use before needing to recharge. Lower that to two hours if you use the built-in MP3 player with the screen on and backlit.

Complementing the large screen is a built-in rotatable camera, with a maximum resolution of 100,000 pixels. Images captured by the camera appear crisp and clear on the CLIE, but the same can't be said when they're viewed on a desktop. Watching short movies is also possible, although they appear very pixellated and at a low frame rate.

Perhaps the most impressive feature of this unit is the powerful Dragonball Super VZ 66MHz processor – twice the speed of any other Palm OS-based PDA currently on the market – supported by 16MB of RAM and 8MB of Flash memory. Unfortunately the small amount of memory isn't going to last long once you start making use of the unit's multimedia capabilities, so you're going to need to use the Memory Stick port (add $245 to the price for a 128MB Memory Stick). The multimedia capabilities are worth it: the MP3 player offered exceptionally clear audio at high volumes, which we expected due to Sony's audio pedigree.

In terms of applications, the CLIE has the standard range of Palm OS apps, and for novelty you can use the unit as a remote control for your home TV/hi-fi. The couple of omissions we mentioned earlier are a voice recorder, and a built in mobile phone unit. We have to mention the woeful PC software included with the CLIE, which was a major pain to both install and use.

While this is one of the most feature rich PDAs available, it pays for it by also being one of the largest Palm OS PDAs, with a low battery life and high price. But if you value style over substance, these concerns will be a moot point.

SPECIFICATIONS

Weight: 200 grams; size: 70mm x 14mm x 137mm (or 255mm extended).
Website: Sony www.sony.com.au
Supplier: Sony www.sony.com.au
Phone: Sony 1800 017 669 **Price:** $1,349

7/10

Jaton SoundPlus 5.1

Jaton has been manufacturing PC components since 1983, and is best known for its range of 3D-Force VGA cards, so the addition of a 5.1 speaker system to its product line was surprising, particularly a set of this standard. Designed more for a home entertainment center, or home theater with DVD player or Dolby receiver, the Jaton SoundPlus 5.1 speakers aren't aimed at the PC user market. After all, 300 watts total power is probably overkill for PC gaming. But isn't that what *Atomic* is all about? These speakers give you extreme sound – guaranteed to have your neighbours never talk to you again.

The satellite speakers output 20 watts RMS at 8 ohms and the subwoofer outputs 50 watts RMS at 8 ohms. The satellites have a signal to noise ratio of up to 86dB and the subwoofer up to 96dB. Both the 8" subwoofer and the 3" satellites are solidly constructed, with built in overheat protection and magnetic shielding.

8-gauge wire is supplied to connect it all together, which basically allows a better signal transfer than standard speaker wire. A G9 (DIN) cable is also supplied, but you will need a few adaptors to connect the speakers to a 5.1 sound card.

As well as your PC, these speakers can be directly connected to a DVD player/decoder with 5.1 outputs for some truly awesome home cinema sound. When we fired up a little DVD movie some of you may have heard of called *The Matrix*, the sound quality was seriously impressive: a deep thumping bass, crystal clear high tones even at high volumes, and barely a trace of audible distortion. A few rounds of Medal of Honor in surround sound mode was equally impressive in terms of overall sound quality.

For surround sound listening, this system is ideal. There are no adjustments for tone, however, so any equalisation tweaking would need to be done via your sound card software, or by running the speakers from a receiver which allows such adjustments. The volume controls are at the rear of the subwoofer, and in the absence of a remote control, the use of a receiver becomes more practical.

This speaker set from Jaton is a great solution for home cinema buffs or those who just want to destroy their hearing playing games.

SPECIFICATIONS

Frequency: satellites 70Hz – 20KHz; subwoofer 33Hz – 400Hz.
Website: Jaton Technology www.jaton.com.au
Supplier: Jaton Technology www.jaton.com.au
Phone: Jaton Technology (03) 9873 3999 **Price:** $499.00

8/10

Creative Nomad Jukebox 3

atomic HOT

The previous Nomad Jukebox from Creative came with a 6GB HD. Being the mad modders that we are, many of us found that we could thumb our noses at the warranty and swap out the HD, which was a standard laptop type IDE drive, for a larger one, 20GB being a popular choice. Whether v3 of the Jukebox is a direct response to that or just part of a planned upgrade to the product line, the new Jukebox is now shipped with a 20GB HD, leaving us wondering whether or not to mess with nature once more. (We think we should.)

The design from the original Nomad Jukebox has not changed significantly; the notable improvement, apart from its obscene amount of MP3 storage, is the inclusion of a FireWire interface, which means 10 times faster file transfers. We could complain about no support for USB 2.0, but perhaps we are just fussy. The headphones are crappy, as is often the case with most MP3 players, so toss them and get some decent ones.

There is a line-in socket, which is both standard and optical. We can record directly to our MP3 player in up to 320Kb/s MP3 format or 48.9KHz WAV format.

The Jukebox is supplied with one 3.6 volt Lithium Ion battery, but has the provision to install two batteries. However the single battery easily gives you 10 hours playing time, which is a massive improvement on previous models. Buffering the entire track to memory as it starts playing, instead of playing directly from the hard drive, improves battery life and performance.

The Jukebox also comes with EAX settings, but if you use them you won't be able to hear the music the way the artist intended. If that's your thing, they are clever and convincing.

The Time Scaling feature is useful: it adjusts the speed of the track without affecting the pitch. You could try picking out and copying a guitar riff, for example, by slowing the track.

The ability to store up to 8000 tracks requires a fairly decent playlist management system. The Jukebox handles this well by allowing you to build custom playlists, or sort by Artist, Title, Genre, or Album, assuming these details have been embedded in the ID3 tag. This information can be managed through the bundled Creative Play Centre.

This is not a cheap MP3 player, but you get what you pay for. Space for 8000 tracks, with all the other features this player has to offer, makes this one of the best MP3 players around.

SPECIFICATIONS

16MB DRAM; 20GB HD; USB/FireWire interface; up to 98dB SNR (line-out); 20Hz~20-KHz frequency response.
Website: Creative Labs www.creative.com
Supplier: Creative Labs www.creative.com
Phone: Creative Labs (02) 9666 6100 **Price:** $999

9/10

LaCie Fusion CD-RW 24x12x40x

The makers of CD burners seem to be in overcompensation mode when it comes to external CDRW drives. I mean, when your design team's role has been to make slightly funky beige faceplates for so long then the explosion in external burners driven by the widespread availability of USB 2.0 and IEEE1394 provides the perfect opportunity for them to unleash their frustrations.

Enter the LaCie Fusion CDRW 24x12x40x. This sleek looking unit is made with an Aluminium shell and funky blue LEDs, and uses USB 2.0 to obtain decent read/write speeds. In the past we have tested a lot of external IEEE1394 drives and have been incredibly impressed by the rock solid performance they've delivered, and last month Lite-On also impressed with its USB 2.0 drive.

In our CDSpeed2000 tests the read performance of the Fusion 24x12x40x drive was curious. It would keep the motor consistent until it reached 39x data transfer speed at about the 52minute mark on a CD, then performance would plummet and the drive motor would spin back up again until it finished reading at 22x.

In the lower speed write tests, performance was rock solid, however, rather than the 24x advertised speed, the most we could burn at was 16x. The glitch in read speed seems strange. At that point the data transfer rate was still well below the bandwidth available through USB 2.0, and it happened on different USB 2.0 controllers, different CDs and different motherboards.

One can only assume it is an idiosyncrasy associated with the drive, because it doesn't affect write performance, but it will make entire CD reads slower than they could have been.

Perhaps the major annoyance with this drive is the disc ejection mechanism: in order to eject a disc the drive has to be both powered and connected to an active USB 2.0 connection.

This 'locking' of the drive is a good idea if you are afraid of a disc falling out, or the lid being damaged by accident when transporting the drive, but it is highly frustrating when you need to connect the drive and power up a machine just to get at the disc inside.

Apart from the strange read performance, the drive has decent write performance (even if this is not at the advertised 24x) packed into a sexy looking housing.

If it is style you are after in an external drive, then this is a strong contender, but there are a few too many frustrations for those who are just after a good external burner.

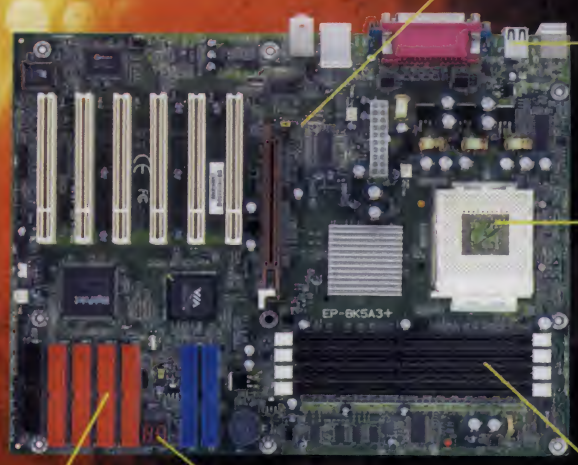
SPECIFICATIONS

40x read, 10x rewrite, 24x write; USB 2.0 external connection; Aluminium housing.
Website: LaCie www.lacie.com
Supplier: LaCie www.lacie.com
Phone: LaCie (02) 9669 6900 **Price:** $399

7/10

THE BEST VIA KT333 MAINBOARD IS COMING!

EP-8K5A3+



AC 97 **6CH** Audio
Supports Digital SPDIF (optional)

10/100 Mb LAN
6 x USB 2.0 (2 optional)

AMD Athlon
XP / Athlon / Duron
200 / 266 MHz FSB

HPT 374 Supports
4 x ATA-133
RAID 0,1 and 0+1

Post Port
Debug LED

4 x DDR DIMM Max. 4 GB
PC 2700/2100/1600 DDR SDRAM

USB 2.0

RAID
4 x ATA-133

LAN

6 CH
6CH Audio

KBPO

STR

Thermal Protection

Ultimate clock setting
up to 250MHz

● All trademarks are the property of their respective owners ● Product specification is subject to change without notice

Westan
Distributor:

WESTAN PTY LTD
21 LIONEL ROAD
MOUNT WAVERLEY
3149 VICTORIA - AUSTRALIA
TEL: 61-3-95437733
FAX:61-3-95440602

Morning Star

MORNINGSTAR COMPUTERS P/L
7/173-181 ROOKS ROAD,
VERMONT,VIC 3133
PH. 03-98741066
FAX.03-98744699

EPoX

346,Chung San Rd.,Sec.2,10F1., Chung Ho City,
Taipei Hsien 235 Taiwan R.O.C.
TEL: 886-2-2247 9888 FAX: 886-2-2247 7888 http://www.epox.com

DACAL CD Library

Once your software and music collection surpasses thirty or so CDs, finding what you're after usually involves ripping out the entire collection and sorting through them, one by one. It's a great way to waste time, but for those who have experienced the Great CD Treasure Hunt, the DACAL CD library offers a simpler method of storing your CDs.

It looks like a hi-tech lettuce crisper: this rotary unit can store up to 150 CDs (minus their cases), with only a small footprint of 35cm diameter by 18cm height. If you don't want to hook it up to your PC, a small booklet is included that has room for 150 entries, with space for information regarding each CD. To extract a CD, simply select the CD number with the small dial on the front of the unit, and the correct CD will pop out in a matter of seconds.

However, there's an easier way to do it: hook the unit up to your PC via the included USB cable and a small database application will allow you to enter the details for each CD you store in the library. You can also scan each CD for its filenames, which are stored in the database and tied to each CD slot number.

Other than its sheer ugliness, the only other noteworthy problem with the DACAL CD Library is that the CDs aren't locked into position within the unit – so if you tilt the unit, your CDs are likely to fall out of their relevant slots, creating one giant collective CD mess. Fun stuff. But it doesn't end there: when the CD is ejected, you have to grab its edge with your fingers (unless you happen to be wearing gloves at the time, and we won't even go there. . .). This disgusting practice could lead to grubby fingerprints on the edges of your CDs, which falls squarely into Atomic's list of Not Good Things To Do To Your Software™.

If you have a huge collection of backed up information that surpasses 150 CDs, then up to 128 of these libraries can be linked up via the USB port. You can stack a maximum of five libraries on top of each other, which helps keep space requirements to a minimum.

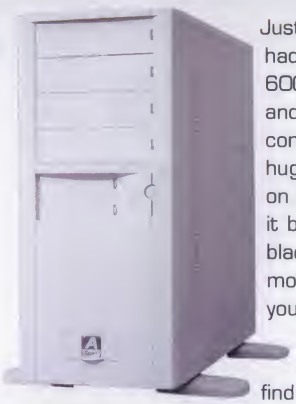
While it's certainly not cheap (for what it does), nor attractive, those with large CD collections could find this unit to be a godsend. Searches for the thingamagig file you backed up last year, and now desperately need, could take a mere 20 seconds instead of the hour or so it used to take.

SPECIFICATIONS

Plastic construction, space for 150 CDs, database application for storing CD info.
Website: DACAL www.dacal.com.tw
Supplier: AusPC Market www.auspcmarket.com.au
Phone: AusPC Market (02) 9817 2899 **Price:** $198

7.5/10

AOpen H600A



Just when you thought the beige case had gone the way of the Voodoo 5-6000, along comes AOpen's latest and greatest place to store all your computery bits, the H600A. Given the huge range of silver and black cases on the market at the moment, could it be that beige is the new black and black is the new beige? At least it's more likely to match the colour of your CD or DVD drive.

If you can forgive this midi-tower's beige exterior, you'll actually find it to be a very worthy home for your silicon soul. It's not quite the largest midi-tower on the market, at 460mm(D) x 200mm(W) x 457mm(H), but this gives it enough space to contain four 5.25" drive bays, all of which can be externally accessed, and five 3.5" drive bays, of which two can be accessed externally.

When it comes to places to mount your case fans, this case has enough mounts to operate as a part time wind tunnel. A total of five different mounting locations are included: two at the rear below the PSU, two at the side next to the drive bays, and one at the front. Only one of these, the rearmost, actually arrives with a fan in place.

While this case regrettably doesn't have a removable motherboard tray, the interior is definitely a finger friendly zone, thanks to all the metal edges being rounded. You can mount practically any form factor motherboard into the case, including ATX, microATX, Full AT and flexATX. Removing either side of the case is easy thanks to the user-friendly thumbscrews.

Like most cases these days, a multimedia port is built into the front, and it contains a microphone input, a headphone output and two USB ports. A FireWire port is optional. Unfortunately the connections for the sound ports won't fit anything other than an AOpen motherboard, making them next to useless unless you want to delve into some soldering action.

Three flavours of AOpen ATX PSUs are available: a 300W, 350W and finally the 400W. The model we checked out arrived with the 300W PSU, and sells for a measly $210, including the PSU. Compared to many budget cases, the AOpen PSUs are of a decent quality, but not up there with brands such as Topower.

If you're after a sturdy and spacious case at a very reasonable price, and you're not too worried about looks or using the multimedia port on the front, then this is the case for you. And if you really want a fancy schmansy tower, the H600A could be the perfect base for your next case modding project.

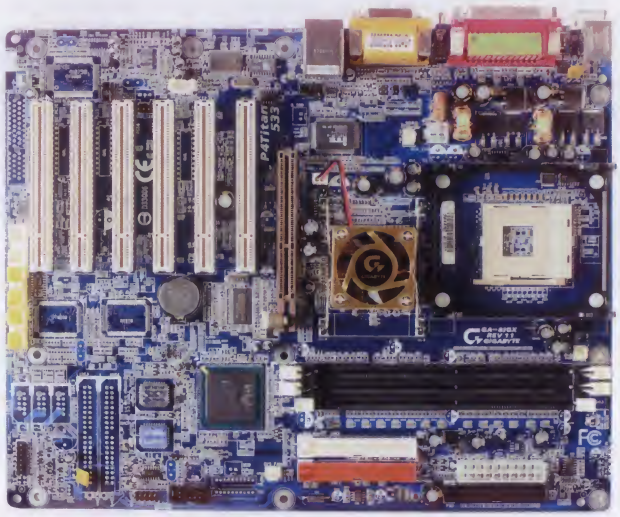
SPECIFICATIONS

Midi-tower; 300W; 350W or 400W PSU included; 5 x 3.5" and 4 x 5.25" drive bays.
Website: AOpen www.aopen.com
Supplier: Servex www.servex.com.au
Phone: Servex (02) 8745 8400 **Price:** $210 with 300W PSU

8.5/10

Gigabyte GA-8IGX

Extreme graphics or extremely crap graphics? John Gillooly finds out.



For a nanosecond in the lead-up to the launch of Intel's next generation integrated graphics architecture, someone somewhere though it may actually be a decent performance solution for gaming. This was partially due to Intel touting that it would deliver 10 times the performance of previous generation chipsets. Now this sounds very tempting indeed, until you realise that Intel is talking about the integrated graphics featured as part of its 810 and 815 SDRAM chipsets for the Pentium III.

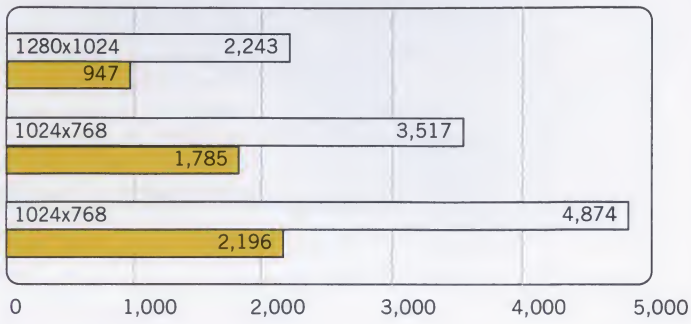
The i845G chipset features this new 'Intel Extreme Graphics' architecture built into the 533MHz FSB and DDR266 supporting Northbridge. Attached to this is Intel's new ICH-4 Southbridge, which supports USB 2.0.

Apart from the abortive mess of the i740 and i752 discreet graphics chipsets, Intel has always targeted its integrated chipsets at the business market. The chipset does include 3D acceleration, as is the norm nowadays, but it is targeted squarely at the 'casual' gamer. From our conversations with Intel, casual gamers are defined as those who play the occasional game to wind down from a long day of work and who don't need the latest and greatest 3D bells and whistles. Therefore the i845G lacks any onboard transform and lighting functions, unlike the competing SiS650 integrated chip. It does, however, feature some funky 3D functions such as the Tile Based Rendering like Zone Rendering Technology, and Dynamic Video Memory Technology, which involves a reorganised 3D pipeline to minimise issues with system RAM as a framebuffer.

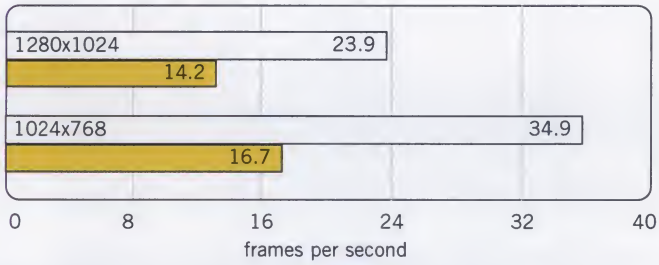
Gigabyte has used this chipset to make the GA-8IGX motherboard, which maintains the business-oriented focus of the chipset by offering minimal extra features. Like all i845G and i845E based boards, it supports DDR266 and the new 533MHz FSB line of Pentium 4 CPUs. It has an AGP slot for those after the latest 3D features, but if that is the case then an i845E, SiS645DX or VIA P4X333 based board is a much better option for those who want a good DDR chipset for their P4 system.

Seeing as the i845G is aimed at the casual gamer, we have decided to be generous and benchmark the integrated graphics against a now aging GeForce2 MX-400 card. For system tests we have used an ASUS P4B533 i845E based motherboard.

3DMark2001SE Pro



Serious Sam SE



i845G with GeForce2 MX400 i845G with Integrated Graphics

SYSmark2002 performance is 5% slower than that of the P4B533, as would be expected given that the difference between the chipsets lies mainly in the addition of integrated graphics, which use system resources to a greater degree than a separate graphics card.

Our 3D tests show the poor performance of Intel Extreme graphics for even low resolutions in modern games. As we have said, the GeForce2 MX-400 lags well behind current cards, and the i845G's graphics lag well behind the GeForce2 MX-400. At the generously low resolution of 800x600 the GeForce2 MX-400 is 121% faster than the i845G in 3DMark2001SE and 109% faster in Serious Sam SE. The i845G fares slightly better at 1024x768 thanks to boosts made by the Zone Rendering Technology, narrowing the 3DMark2001SE gap to 97% and the Serious Sam SE gap to 68%.

Extreme is one thing that this graphics chipset certainly isn't. With performance sitting at such a low level, the i845G may be a highly competent renderer of spreadsheets and give blinding framerates in freecell, but it doesn't even have pretences of being a chipset capable of coping with modern 3D games. The Gigabyte GA-8IGX is a decent enough motherboard, but only shines when you populate the AGP slot with a card that doesn't suck, and for that you only need a cheaper i845E board.

SPECIFICATIONS

Intel 845G chipset; 533MHz FSB P4 support; DDR266; USB 2.0.

Website: www.gigabyte.com.tw

Supplier: Synnex www.synnex.com.au

Phone: Synnex 1300 880 038 **Price:** $289

6/10

WinFast A250 series

Revolutionary 3D Sensation, Seeing is believing

Bi-Turbo Cooling System with Anti-Dust filter design

Leadtek®
We Make Dreams a Reality

http://www.leadtek.com

WinFast A250 Ultra TD

- ★ Bi-Turbo Cooling System with Anti-Dust filter design
- ★ WinFox II Driver provide most stable overclocking environment
- ★ NVIDIA GeForce4 Ti 4600 GPU
- ★ TV-out with resolution up to 1024 * 768, 8 sets of filters provide better quality
- ★ Enhanced Chipset/Memory clock up to 300MHz/650Mhz
- ★ 3D claculation speed at an unbelievable 1.23 trillion operations/sec
- ★ Fill rate at an incredible 4.8 billion AA samples/sec

WinFast A250 Ultra TD	WinFast A250 TD	WinFast A170 DDR TH
nVIDIA GeForce4 Ti 4600 GPU	nVIDIA GeForce4 Ti 4400 GPU	nVIDIA GeForce4 MX 440 GPU
128MB DDR Memory	128MB DDR Memory	64MB DDR Memory

2 YEAR WARRANTY

Software Pack

DirectX8 and T&L 3D games included
GUNLOK, DRONEZ (full retail version)
WinFast DVD from Leadtek
True Internet Color, Colorific, 3Deep, Cult3D

MASTER AUSTRALIAN DISTRIBUTER

Quality Endorsed Company

NSW Office
(02) 9648 0888
Fax: 9648 0999
51 Hill Road
Homebush Bay
NSW 2140

VIC Office
(03) 9646 4388
Fax: 9646 4133
41 Brady Street
South Melbourne
VIC 3205

QLD Office
(07) 3852 5288
Fax: (07) 3852 5299
41 O'Connell Terrace
Bowen Hills
QLD 4006

BCN Technology
www.bcntech.com.au
sales@bcntech.com.au

Swann VersaCam MINI

Swann's VersaCam MINI is aimed right at the budget market with a price of only $79.95. It's based on a STV0672 CMOS sensor and uses a USB connection, and it performs better than first expected. The image produced by the VersaCam MINI is reasonably viewable, even in a poorly lit room — we tested this hunched over a PC, with a single light and a desk lamp. Unlike other sub-$100 cams, the image was surprisingly clear. Under poor lighting at 640x480 resolution and a pixel depth of RGB 24, it displayed the typical graininess seen with most lower-end Webcams, however the motion was smooth and relatively flicker free, and the graininess disappeared with an improvement in available light. Unfortunately the colour was somewhat faded and washed out, and only just within acceptable limits, even after adding more light, adjusting the colour, brightness and contrast controls. The image never appeared completely focused and this can't be fixed as there is no manual focus control, nor is there a shutter button for taking still shots. If you do want to take still shots with this Webcam you'll need to use the driver software, meaning that you'll have to be within arm's reach of your keyboard or mouse.

The installation process is painless and will even update your Windows Installer files if required. The driver software is easily configurable, but it's best left at its default settings if you don't quite know what you are doing.

The VersaCam MINI is bundled with Smart Cam 2.1, Ulead Photo Express, and Ulead Cool 360, which lets you use the camera to create 360 degree panoramic shots of your office, bedroom, bathroom. . . cough.

The Webcam is fitted with a spring loaded clip type device so that you can mount it on the edge of a laptop, and is supplied with a rubber-footed stand for desktop or top-of-monitor use. The camera itself has a flexible tilt swivel, allowing a 360 degree view without the need to remove it from its mounting.

It is important to remember that this is a budget option designed strictly for personal usage, such as video emails and the amateur Webcam frolics which some of you like to get up to – yes, you know who you are.

For those purposes this Webcam performs well, and is certainly value for money.

SPECIFICATIONS

CMOS Sensor; 640x480 resolution; up to 30 FPS frame rate; 1/3" Lens; 30mm to infinity fixed focus; 300,000 pixels

Website: Swann www.swann.com.au

Supplier: Swann www.swann.com.au

Phone: (02) 9809 3199 **Price:** $79.95

6.5/10

X-Media DreamBox

atomic HOT

When the guys from Jaton showed us the X-Media DreamBox, we were somewhat skeptical that something so simple could achieve so much. However, exhaustive Atomic Testing(tm) showed us that this box is indeed quite remarkable: it has been designed to be connected to an LCD or CRT monitor to allow a user to watch video from pretty much any signal, without needing to power on the PC. The DreamBox has two AV inputs, an s-video input, a VGA input and TV ANT which helped it perform flawlessly when we tested it with a DVD, a digital video camera, a Sony Playstation, and a CATV signal. Audio input and output are included as well, so you can plug a set of powered speakers directly into the DreamBox, if required, or send the sound signal to your PC's sound card.

Picture quality when using most lower-end TV-tuners is relatively poor, however the DreamBox uses the Trident DPTV-DX chip, which allows a much better result by using the latest integrated interlacing and progressive scan refresh techniques. This chipset also allows the PIP (Picture-In-Picture) feature, so you can watch your favourite trashy TV shows while you work. Plug your co-ax antenna into the DreamBox, then use the supplied 5-foot monitor pass-through cable, and you'll be able to set up your video or TV image in a window overlaid on your desktop – without the need for any software or drivers and irrespective of your operating system. WOOt!

As the DreamBox is designed to work without the PC and no software is required, all configuration takes place on screen via the supplied remote control. The OSD is fairly straightforward in its navigation, with a bunch of settings you probably won't need to mess with, but if you want to get stuck in you can set up video colour/display settings, aspect ratio, DCTI (Dynamic Chrominance Transience Improvement) DTFNR (Dynamic Temporal frame-Filtering Noise Reduction) and other cool sounding acronyms.

Also available within the OSD are the audio settings, Clock/Sleep/Alarm settings, closed captions support, resolution settings (up to 1024x768), and picture-in-picture controls.

The DreamBox is everything it says on the box. There are similar products available if you look hard enough, but none that seem to offer this many features. Due to its simplicity in design and use, this one is highly recommended.

SPECIFICATIONS

8" x 2" x6" (WHD); Video Output: VGA out (DB 15); Video Signaling: NTSC/PAL

Website: Jaton www.jaton.com.au

Supplier: Jaton Technology www.jaton.com.au

Phone: (03) 9873 3999 **Price:** $299.00

9/10

GIGABYTE™
TECHNOLOGY

Symptoms: Fear of Low Speed
Treatment: FSB 533MHz

Superb choice to speed up your Pentium® 4 processor!

Note: Only for Pentium® 4 computers. With Intel® new FSB 533MHz processors, better performance will be presented.

P4 Titan DDR · USB2.0 · ATA133 RAID · FSB 533

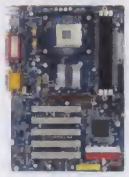
GA-8IEXP Intel® 845E Chipset

- Socket 478 for Intel® new 0.13 micron-process Pentium® 4 processor
- Provides 6 high speed USB2.0/3 IEEE1394 ports
- Promise IDE RAID 0,1 and Ultra ATA 133 support
- GIGABYTE patented DualBIOS™ technology
- Intel® PRO/100 VE Network Connection
- High quality Creative PCI Sound and 5.1-channel support via S/P DIF output
- Round corner PCB plate design for better durability
- Rich in Overclocking features via BIOS setting

P4 Titan DDR · USB2.0

GA-8IE Intel® 845E Chipset

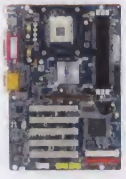
- Socket 478 for Intel® new 0.13 micron-process Pentium® 4 processor
- Provides 6 high speed USB2.0
- GIGABYTE unique EZ-Fix AGP slot
- Integrated high quality 6 channel AC97 audio
- Round corner PCB plate design for better durability
- Rich in Overclocking features via BIOS setting



P4 Titan DDR · USB2.0 · FSB 533

GA-8IG Intel® 845G Chipset

- Socket 478 for new 0.13 micron-process Intel® Pentium® 4 processor
- Provides 6 high speed USB2.0
- Integrated Intel® Extreme Graphics engine
- Integrated high quality 6 channel AC97 audio
- Round corner PCB plate design for better solidness, better appearance
- GIGABYTE unique EZ-Fix AGP slot



Award News

Taiwan Symbol of Excellence
1998~2002
5 years in a row

* These speed settings are not guaranteed by GIGABYTE
– The specification and pictures are subject to change without notice
– All trademarks and logos are the properties of their respective holders
– Any overclocking is at user's risk. Gigabyte Technology shall not be responsible for any damage or instability to your processor, motherboard or any other components

For more information, please call our distributors:

N.S.W.	HALLMARK	02-9748-8811	QUEENSLAND	SYNNEX	07-3876-7222
	GLOBAL	02-9644-3900	PERTH	SYNNEX	08-9201-9800
	SYNNEX	02-8877-9800		HALLMARK	08-9477-5440
			ADELAIDE	HALLMARK	08-8340-3740
VICTORIA	HALLMARK	03-9540-8555		SYNNEX	08-8365-6866
	SYNNEX	03-9538-0000	DARWIN	HALLMARK	08-8981-9111
	RECTRON	03-9561-6166			

GIGABYTE

GIGABYTE™
TECHNOLOGY

www.gigabyte.com.tw

Cooler Master ATC600

Since the sudden rise in popularity of MP3 files, DivX movies and DVD drives, there has been a steady migration of a home's second PC from being tucked away under the study desk to a prime position in the family or lounge room, next to the TV or hi-fi system. Unfortunately, due to the large size and inconvenient shape of most PC cases, these entertainment PCs have stuck out like a Goth at a Wiggles concert. But thanks to Cooler Master's new ATC600, you can now disguise your entertainment PC as yet another component in your hi-fi system.

Due to the small size of the case, the ATC600 can only mount a MicroATX motherboard, although it will happily fit a full sized ATX PSU. Behind the flashy, downward-opening acrylic front door are two 5.25" bays, just waiting to be filled with a DVD drive or two, but there is no external opening for a floppy drive (which you probably wouldn't need on an entertainment box anyway – how many movies do you know of that can fit into 1.44MB?). Two USB ports and a single FireWire port are also located on the front of the case, although you'll need to check if your motherboard sports the headers to handle the USB ports.

Due to its confined interior, drive bay space is limited, with only two 5.25" drive bays and two 3.5" drive bays. In keeping with Cooler Master's excellent reputation for case airflow, three Y.S. Tech 3,000RPM 60mm fans are included, but you'll probably want to disconnect or slow some of these down to lessen fan noise if you're using it as an entertainment unit.

A sturdy Aluminium beam straddles the top of the interior, strengthening the unit so you can stack other components on top.

Like the rest of the Cooler Master range, this case is an absolute stunner to look at, but so is its price. At $550, without a PSU, it's definitely a case for those with money to burn. Regardless of the cost, this has to be one of the most attractive PC cases we've ever seen, and would definitely look more at home in your lounge room than your standard beige brick.

SPECIFICATIONS

Aluminium construction; 2 x 5.25" and 2 x 3.5" drive bays; acrylic front door.

Website: Coolermaster www.coolermaster.com

Supplier: AusPC Market www.auspcmarket.com.au

Phone: AusPC Market (02) 9817 2899 **Price:** $550, w/out PSU.

8/10

Hercules Prophetview 920DVi

As an upgrade to its Prophetview 720, Hercules has released the Prophetview 920 and Prophetview 920DVi. The DVi model supports both DVi and VGA graphics cards, and is supplied with a small DVi to VGA adaptor.

The Prophetview range is probably the most aesthetically appealing of all the LCD monitors currently on the market. Constructed from a combination of plastic and Aluminium, in a Titanium-blue metal finish, the unit is surprisingly solid and rugged (although we didn't do a Frisbee-mark test to confirm this). Weighing 5.6kg, it is not too difficult to drag around to LANs.

The contrast ratio in this model is 350:1, which is better than its predecessor's 300:1. It has a typical brightness of 250 candelas per square metre and provides a bright sharp image in most environments. Supporting a maximum resolution of 1280x1024, this active-matrix TFT screen is suitable for pretty much anything: jumping into a word processor, fonts were clear and sharp, better than on many CRTs we have seen. 3D game playing visuals were up to standard, compared to similarly spec'd display devices. However, watching a DVD on this monitor was a little disappointing, with some blocking of colour and a slightly washed out appearance in darker areas. Adjusting brightness and colour temperature settings did help somewhat, but needed to be set back again when other viewing situations called for it.

The Prophetview 920 and 920DVi have a viewing angel of 130 degrees, which means you need to be viewing the screen at an angle of more than 65 degrees before the picture fades out of view. This is a common feature of LCD monitors, with the cheap-arse ones having small viewing angles by comparison.

The monitor height is fixed on a cast Aluminium stand, but the screen can be tilted a maximum of 20 degrees back and forward, depending on your preferred viewing position. Failing that, the monitor can fairly simply be wall or arm mounted.

The On Screen Display, accessed by five digital Titanium buttons on the front right, is simple to navigate and provides decent control over the on screen image.

Price is always a critical factor, and 17 inches of LCD viewing size for around $2000 is not the cheapest, nor the most expensive. However, the price is justified by the quality and style, and is a reasonably impressive offering from Hercules.

SPECIFICATIONS

43.2cm (17") TFT colour LCD; pixel pitch: 0.264 mm x 0.264 mm; scanning frequency: H: 30-75 KHz V: 50-80 Hz.

Website: Hercules au.hercules.com

Supplier: Hercules au.hercules.com

Phone: Hercules (02) 8303 1818 **Price:** 920 $1799;DVi $1999

8/10

Millennium Silver
The World First Silver Card

新登場

TRIPLEX

"Millennium Silver, the revolutionary PCB series of Triplex, targeted at PC users who require high performance and outstanding value."

"Triplex's leading R&D teams not only coat the surface with a thin shiny silver colored metal but also silverised the "inner" of PCB".

Excellent Cooling Design
Real testing and real application tell that Millennium Silver PCB represents better cooling rate up to 15%

Less Interference
An international testing figures provided by EMI ,an industry standard test, shows dB rate of Millennium Silver is averagely 47% lower than other Graphic Cards.

High Stability
Extremely fast, absolutely reliable. With these properties the Triplex Millennium Silver is the first choice for the most demanding users who ask for optional performance and reliable durablliity under high-speed and long term working condition..

Environmental Consideration
Conventional PCB manufacture procedures require a stannic coating step which contains lead compound causing serious environmental pollution. On the other hand, the Triplex Millennium Silver PCB highly reduces pollution during the process of manufacture.

More information at www.oxygen.net.au and www.triplex.com.tw

OXYGEN™

Australia: Oxygen Corporation Pty. Limited.
Unit 31, 2 Railway Parade. Lidcombe NSW 2141
Tel. 612 9649 4477 Fax. 612 9649 8162

New Zealand: GameKeeper Entertainment (NZ)
Unit 2.01A Ground Level 88 Broadway , Newmarket Auckland
Tel. 64 9523 1228 Fax. 64 9523 1227

NSW: Oxygen Corporation 02 9649 4477
W.A: DMA 08 9445 9500

ACT: Fairstar 02 6257 1808
Softline Distribution 08 9225 7699

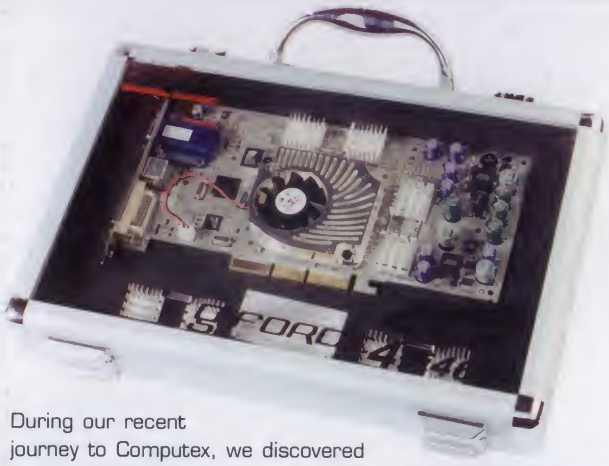
VIC: Oxygen Corporation 03 9696 2286
QLD: Topcom Technology 07 3420 6688

S.A: Jagate Distribution 08 8350 9882
Xpress Solutions 07 3356 0602

Triplex GeForce4 Ti4600

Bennett Ring finds that all that glitters ain't always gold – sometimes it's silver.

atomic HOT



During our recent journey to Computex, we discovered that one of the leading video card brands in Taiwan is Triplex, a company practically unheard of in Australia. We were most impressed with the products it had on display, so were overjoyed when we were informed that the company was about to start targeting the global market. It's with great pleasure that we present Triplex's flagship product: the GeForce4 Ti4600.

While it's totally irrelevant to our final opinion of this video card, as you can see from the product shot it ships in what has to be the most striking package yet used for computer hardware. It's a miniature Aluminium briefcase with a Perspex window, and would look more at home carrying James Bond's silenced pistol than a video card.

This case shows off the video card perfectly, as the card is covered in a very attractive silvery grey finish. According to Triplex, this finish does much more than make this the ultimate video card for those with a Perspex window on their tower of power. It's actually a patented invention, known as the Millennium Silver PCB, which uses a non-disclosed material that has several important benefits, the lesser of these being the spoogetastic silver finish.

First up, and something overclockers will no doubt appreciate, is a reduction in operating temperature. According to Triplex, heat can be reduced by 15%, although we weren't told which part of the video card experiences these lower temperatures. More importantly, the special finish offers much lower interference than traditional PCBs, up to 47%, which has been verified by the international testing firm EMI. The net result is that this card is supposedly more stable than the competition.

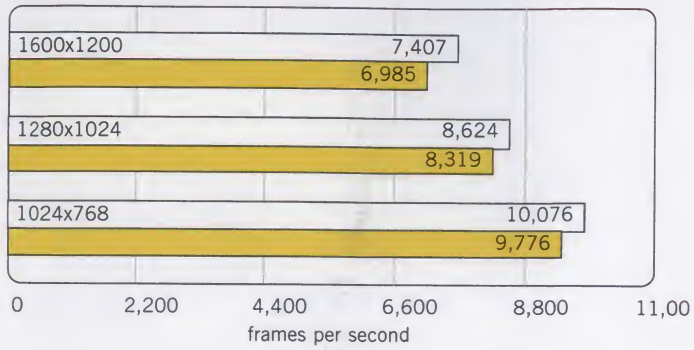
You might think that the end result of these improvements would be the most overclockable video card this side of Antarctica. I hate to let you down (well, actually, I get a kick out of it), but this card doesn't seem to overclock any better or worse than the rest of the pack. We managed to get the core to run at 325MHz, which is a meagre 8% faster than the default speed of 300MHz. The memory faired slightly better, increasing by 9% from the default speed of 650MHz up to 710MHz. This was slightly better than the expected overclock due to the 2.8ns rating of the 128MB of DDR-RAM, which should theoretically peak out at 700MHz. We did manage to clock both the core and memory at slightly higher speeds, but had to wind it back due to image corruption.

In terms of inputs and outputs, the Triplex Ti4600 has the standard collection of connectors seen on most 4600s. There's S-Video In and Out, as well as a regulation 15-pin VGA output and a DVI-I connection. To help keep costs down, the only disks you'll find in the schwinging Aluminium case are a copy of Cyberlink's PowerDirector Pro 2.0 DE, and PowerDVD XP 4.0.

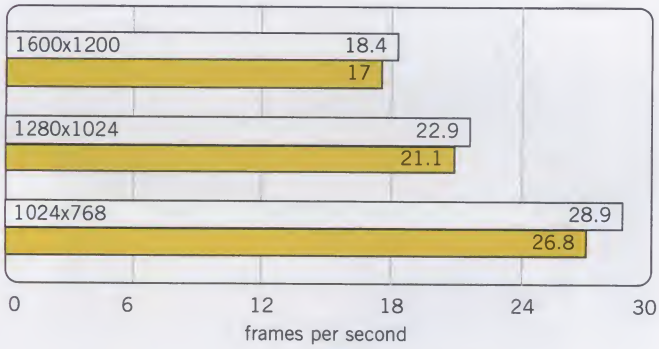
We tested the card with the following benchmarks: 3DMark2001SE Pro, Serious Sam SE Co-op demo and finally the demanding yet delectable Code Creatures. The Triplex GeForce4 Ti4600 scored closely to the other Ti4600 cards we've tested, but usually higher by a frame or two. After overclocking, we saw a maximum performance increase of 8% in the Code Creatures benchmark across all resolutions, and a minimum performance increase of 3% in 3DMark2001SE Pro at 1024 x 768.

At only $670, this has to be one of the cheapest Ti4600 cards on the market. Considering the exceptionally cool case it ships in, and the eye-catching finish of the PCB, this low price is an amazing achievement. Triplex might be a new player in the Australian market, but the future looks bright (in a silver, shiny kind of way) for this Taiwanese kingpin of videocards.

3DMark2001SE



CodeCreatures



Overclocked Default speed

SPECIFICATIONS

Ti4600 GPU; 128MB 2.8ns DDR-RAM; AGP4x; Silver Millennium PCB.

Website: Triplex www.triplex.com.tw

Supplier: Oxygen www.oxygen.net.au

Phone: Oxygen (02) 9649 4477 **Price:** $670

9/10

REAL-TIME STRATEGY REDEFINED.

WHAT WILL YOUR LEGEND BE?

BLIZZARD ENTERTAINMENT

WWW.BLIZZARD.COM

©2002 Blizzard Entertainment. All rights reserved. Reign of Chaos is a trademark and Blizzard Entertainment and Warcraft are trademarks or registered trademarks of Blizzard Entertainment in the U.S. and/or other countries. All other trademarks are the property of their respective owners.

WHAT
WILL
YOUR
LEGEND
BE?
WARCRAFT III
REIGN OF CHAOS

WARCRAFT III
REIGN OF CHAOS

WHAT WILL YOUR LEGEND BE?

THE HUMANS

THE ORCS

THE UNDEAD

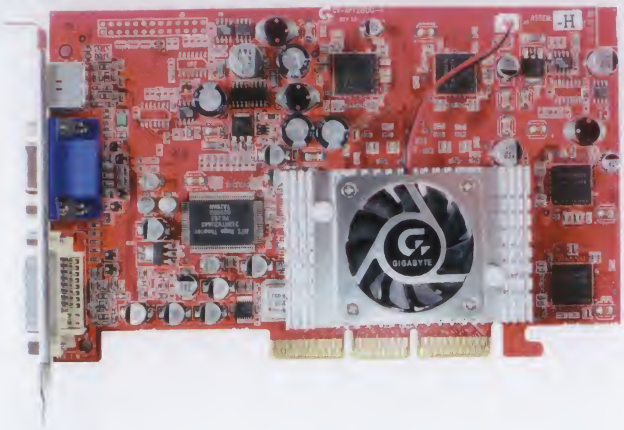
THE NIGHT ELVES

PC
CDROM
MAC OS9
and higher
Multiplatform

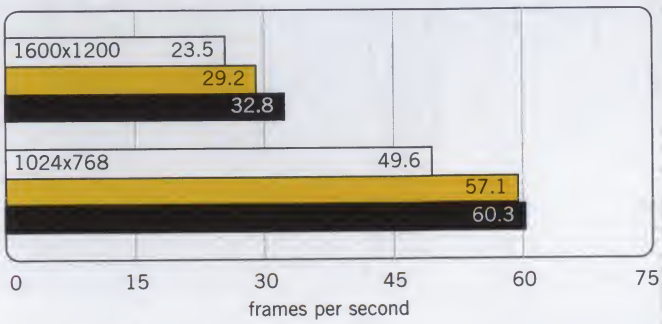
G8+

Gigabyte AP128DG-H

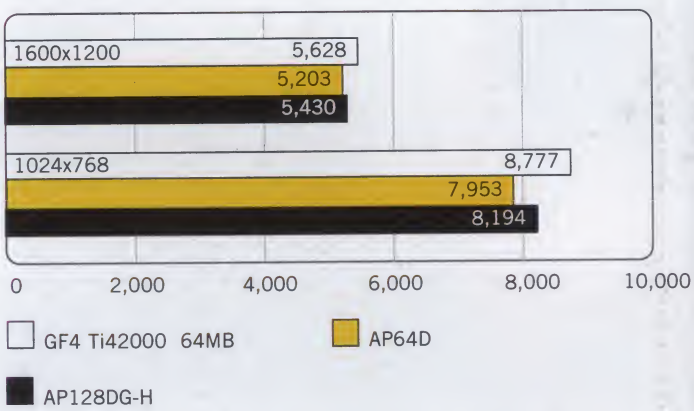
The RADEON 8500 gets 128MB of the good stuff, and John Gillooly has a taste.



Serious Sam SE



3DMark2001SE Pro



Driver maturity is a wonderful thing. The RADEON 8500 series of cards has been able to keep up with the competition largely through incremental performance boosts given by ATI's driver development team. As everyone eagerly awaits the RV250 refresh of the RADEON 8500, and the next generation R300 chipset from ATI, manufacturers are undertaking small hardware improvements in order to keep the RADEON 8500 chipsetxxxxx bubbling along.

Depending upon the timeframe for the RV250 release, we may soon see a new variant of the 8500, the RADEON 8500XT. It features a 300MHz core paired with DDR RAM running at an effective 600MHz, up from the 275MHz core / 550MHz RAM on the current RADEON 8500. It will also sport 128MB of memory, a configuration seen on the Gigabyte AP128DG-H.

128MB of RAM is now seen as the norm for high-end 3D cards, even though it would rarely be used under normal circumstances. NVIDIA justifies the use of 128MB on the GeForce4 Ti series by emphasising the need for large amounts of RAM when using advanced features such as anti-aliasing and anisotropic filtering, however we are unlikely to see 128MB of RAM needed for normal game performance for a long while yet.

When you compare the AP128DG-H with the 64MB AP64D model there are several noticeable differences: the AP64D is dominated by a huge heatsink that covers both the GPU and the RAM on both sides of the card, whereas the AP128DG-H has a relatively small heatsink for the GPU only. The AP64D uses large, cheaper TSOP-II RAM chips, and the AP128DG-H uses the smaller FBGA chips. The layout differences between the cards are purely in order to incorporate these different RAM packages, with little impact on the performance that can be squeezed out of the RADEON 8500 core.

We tested the AP128DG-H using our normal suite of 3D benchmarks, which consist of 3DMark2001SE Pro, Serious Sam: SE and Codecreatures benchmark Pro. The results have been compared to the 64MB AP64D and the current price performance champion GeForce4 Ti4200 card.

In 3DMark2001SE Pro the AP128DG-H shows a consistent performance boost of in the range of 3% (jumping to 4% at 1600x1200), while in Serious Sam: SE the gap ranges from 5% at 1024x768 up to 10% at 1600x1200. In Codecreatures the AP128DG-H leads the AP64D by between 34-40%, due to the benchmark using 128MB of video RAM, relegating the AP64D to the indignity of using system RAM shared via the AGP port.

When compared to the GeForce4 Ti4200, the AP128DG-H is definitely no slowcoach. Despite lagging behind the GeForce4 Ti4200 in 3DMark2001SE Pro, it stays close, especially as resolutions increase. In Serious Sam: SE, the reverse occurs, with the AP128DG-H consistently staying ahead of the Ti4200 by 10 frames per second, and in Codecreatures both the cards deliver almost identical results.

Despite its age, the RADEON 8500 keeps on surprising. It cannot touch the upper end GeForce4 Ti cards, but with a price now firmly in the mid range, it can definitely hold its own. It might be more expensive than the GeForce4 Ti4200, but the Gigabyte AP128DG-H provides a fast, feature rich alternative to the NVIDIA way. The only niggle with this card is the burning question of whether the leap to 128MB of RAM is worth it, considering the infinitesimal speed differences between it and its 64MB brother. By the time we actually start needing 128MB of RAM for gaming, it is fair to say that we will be a few generations ahead in the architecture race.

SPECIFICATIONS

ATI RADEON 8500 chipset; 275MHz core; 128MB DDR RAM at 550MHz effective; DVI, D-Sub, TV-Out.

Website: Gigabyte www.gigabyte.com.tw

Supplier: Synnex www.synnex.com.au

Phone: Synnex 1300 880 038 **Price:** NA

8.5/10

02
ATOMICGAMES
MORROWIND

GAMES

Dimensional shift

John Gillooly hasn't been excited by an RTS game for a long while, but that could all change.

There I was, camped high on a hillside, surveying the expansive terrain. A flutter of movement caught my eye in the distance. As the movement coalesced into a humanoid shape I suddenly realized I had the perfect opportunity. It was one of those oh so sweet moments, I knew it hadn't spotted me, so I had the jump. I held my breath in fear of turning triumph into tragedy with something like a misplaced sneeze and went to switch to my sniper rifle. Shit.

I suddenly realized that I wasn't playing a First Person Shooter for the first time in months as I pulled out my sword and stood there, dumbfounded, and swiped aimlessly at nothingness. After laughing at the ludicrousness of the situation I breathed a sigh of relief. For the first time in a long, long while the First Person Shooter was not governing the PC gaming experience. This month marks the long awaited revival of other genres™, with two amazing Role Playing Games and the return of the RTS, accompanied by the sound of much wOOtage from those sick of burst fire and sniper zoom.

Don't get me wrong, I love a good FPS as much as the next gamer, and so does the game development community. But over the past few months a deep yearning for something else kept nagging at me. Plenty of decent enough games have surfaced of late, but there is something about the triumvirate of Neverwinter Nights, Morrowind and Warcraft III that restores faith in the fact that there is something else beyond the sights of yet another MP5.

Diversity is a wonderful thing. The explosion in 3D engines has meant that some game developers have wanted to push the eye candy factor further and further, which has for the most part equaled what we expect of 3D, guns and high speed action.

All three games employ 3D engines in different ways. Morrowind uses the first person perspective that developer Bethesda may not have pioneered, but certainly made a major contribution to. One of my favorite pieces of gaming trivia is that the use of Mouselook came not from someone like id Software, but from Bethesda. I still remember my first experience with the control system. A comment along the lines of 'What is this crap?' became stuck in my memory as I hurriedly searched through the configuration menus of Terminator: Future Shock trying to find a way to turn that blasted Mouselook off.

Morrowind is perhaps the most gorgeous game to yet grace our PC screens. It uses 3D to the fullest, creating an immersive, seamless 3D playground in which we can wander, gasping as we first see the sun set over the pixel shaded waters of Khuul, or jump when hit by our first thunderstorm on the road to Balmora. The sheer amount of anecdotes around the Atomic offices that were caused by Morrowind is testament to the exceptional nature of the game.

After the volume of hype that accompanied the release of Microsoft's Hack and Slash RPG, Dungeon Siege, it was interesting to see that the hype that revolved around Neverwinter Nights in the lead up to its launch seemed to revolve around everything but the 3D engine powering the game.

Yet the graphics engine behind Neverwinter Nights is a wonder to behold: it is smooth, clean and very highly polished. Camera control is fluent and the game looks great at all camera zoom levels. After being relegated to low-resolution 2D RPG landscapes for so long it is great to see that the tide is changing for isometric perspective gaming. Apart from anything, it causes a pang of regret when thinking about the shift to 3D that was due for my personal favourite Isometric game series of all time, Jagged Alliance, which died with the hopes of Sirtech about six months ago.

Warcraft III marks Blizzard's final move to proper 3D. After the partial use of 3D acceleration in Diablo II, it is nice to see one of the premier developers employing 3D in a way that fits so seamlessly into the heritage of overt cartoonishness that has marked the Warcraft series. Sure it is bright and almost garish at times, but it works, and it does so while retaining a gaming heritage that has many a hardened RTSer reduced to tears during maudlin gaming reminiscences.

And let's not forget the pre-rendered beauty that is the hallmark of all Blizzard cut-scenes. Forget that lightweight Squaresoft and its Final Fantasy movie, I want to see the cut-scene crew from Blizzard make an attempt at producing a CGI movie.

I dare anyone to point me towards a finer body of cut-scene work than Blizzard (email me at **jgillooly@atomicmpc.com.au**, prove me wrong).

The future only gets brighter. Bioware is set to follow up Neverwinter Nights with the non-massively multiplayer *Star Wars* RPG, Knights of the Old Republic, which is already looking stunning; Blizzard is still ramping up to the Massively Multiplayer 3D opus, Worlds Of Warcraft; and Bethesda's follow up to Morrowind is as yet unknown, but it is heavily involved in producing new, free plug-in modules for the game.

It is good to see that 3D graphics have finally moved en masse into the genres that have avoided them for so long, and are being employed by developers that are able to employ this tech wizardry in ways that complement and enhance the gameplay experience.

The use of the term RPG when combined with 3D engines no longer just means Rocket Propelled Grenade, and I for one am breathing a huge sigh of relief. Even though that humanoid figure I spotted from the hilltop ended up being a Fire Atronarch who managed to BBQ me into oblivion in twenty seconds flat, at least he wasn't wielding a chaingun.

Warcraft III: Reign of Chaos

Brad Webb picks up a sword and runs to battle in defence of the Alliance.

atomic HOT

ABOVE: The Horde grows in strength. . .

ABOVE: 'Hark! Is that splashing I hear?'

ABOVE: A perfect combination: Orcs and The Plague

Warcraft III: Reign of Chaos is a strange beast. It's not a true Real Time Strategy game like its predecessors; rather it is the product of a fusion between the best aspects of both Real Time Strategy and Role Playing. What has emerged from this fusion is a game that's not only immensely enjoyable to play, it also has an immersive storyline and character involvement that'll keep you wrapped up in the world of Lordaeron for days at a time. You'll strive to save your Heroes from doom, foretell the next plot twist and save the world from a malevolent evil – all while trying to remember that you have a real life, that Lordaeron is imaginary and yes, that you must eat. Occasionally anyway.

There are four playable races in Reign of Chaos: the Human Alliance, which actually consists of Humans, Elves and Dwarves; the Night Elf Sentinels; the Orcish Horde; and the Undead Scourge. Unlike other RTS type games where you can usually play each race in any order you choose, Reign of Chaos dictates when you play each race in order to unravel the overall story.

The game begins with an Orcish prologue, in which we see ancient prophecies foretelling the coming of the 'Burning Shadow' during a battle of epic proportions. The battle scene fades, only to be replaced by a mysterious hooded figure who declares that you, Thrall, are the only one capable of delivering the Horde from the coming slaughter.

Drenched in sweat, Thrall wakes from the dream with the words 'Seek me out' ringing in his ears. The cut-scene ends and your first mission is to seek out the figure from the dream.

This introductory mission serves as a tutorial to get players familiar with the game's controls and, after you successfully complete it, more of the storyline is revealed and you're given instructions on what must be done to save the Horde from annihilation. After another cut-scene in which the Humans receive a similar warning, you begin the Human Alliance campaign.

A few good men – or women

Gameplay in Reign of Chaos revolves around Heroes: the powerful figures who lead your armies and inspire them to great deeds. Heroes have special abilities beyond those of their followers, such as the ability to store and use magical items, scrolls and potions. Each hero may carry six items in his or her inventory. As the game progresses and you learn how to use them effectively, Heroes become vital to your success in battle.

Your Heroes will 'level up' as they attain more experience, giving them a statistics boost as well as access to new abilities and spells. By the latter stages of each campaign your Hero units are extremely powerful and you'll spend much time and effort attempting to use their abilities to the best effect in completing quests.

The quests, of which each mission may have several, are the equivalent of the old 'map objectives' from past Warcraft games. While the main quest must be fulfilled in order to progress through the game, the sub-quests contained in some missions are optional. You don't have to complete them but if you do they can yield powerful items and the occasional special unit, which makes them well worth the effort.

The units themselves range from lowly peons, peasants and wisps, to dragons, gryphons and gargoyles. Unfortunately there are no water units so you're limited to land and air combat. If you are hoping for vast sea battles between mighty Human battleships and endless Orc destroyers, such as those to be found in Warcraft II, you're going to be disappointed.

To help you in your struggles against the enemy, there are various neutral buildings scattered around each map that provide different forms of aid. At the Mercenary Camp you can hire additional units you normally wouldn't have access to, such as Ogres and Forest Trolls. Goblin Merchants will sell you assorted magical potions and scrolls, while the Goblin Laboratory has Zeppelins, Sappers and other goodies available for purchase. Other structures, such as the Fountain of Mana and the Fountain of Health, have a more strategic purpose: wily use of a Fountain of Health for example will allow a small group of warriors to fend off a much larger attacking force time and time again. Due to their power, Fountains of Health, and to a lesser extent Fountains of Mana, are much rarer than other neutral structures.

Reign of Chaos introduces the concept of 'upkeep' to encourage veteran RTS players away from their set gameplay styles. Upkeep is a tax that varies between the levels of None, Low and High, depending on the number of units you have at any one time. The more units you possess, the larger the percentage of your resources taken away for upkeep. While this money isn't used for anything tangible, think of it as a fee to keep the mundane but essential services of any encampment or city running smoothly. When you combine upkeep with a maximum food production of just 90, of which many units will take more than one to sustain, players are encouraged to make spending decisions wisely. Rather than building a hundred of your race's basic attack unit and rushing off to battle, Reign of Chaos encourages well thought out unit mixes for raiding parties as well as upgrading of technology, weapons and armour in order to gain victory and progress to the latter stages.

As far as visuals go, Blizzard has given Reign of Chaos a totally 3D engine, one that does a remarkable job even on relatively low-end systems. Each unit is beautifully rendered, as are the terrain and environment. Textures are vividly coloured and give the game an almost cartoony appearance at times, however the overall effect is a positive one: trees don't look like real trees, but they still look damn cool. We do, however, have one gripe about

ABOVE: The 7th Cavalry rides to the rescue

ABOVE: Note inventory slots for the Hero

ABOVE: Night falls over the Human encampment

how the 3D engine was implemented. For no sane reason we can come up with, Blizzard has limited Reign of Chaos' camera angles. You can zoom in and out on a scene and rotate your point of view 90 degrees either side of the default, but that's it. No 360 degree movement, no overhead shots – nothing. This is a shame and our only real complaint.

From the average to the awesome, we now come to Reign of Chaos' CGI cut-scenes, which deserve a special mention. You would expect the CGI used in games to be of high quality, however these cut-scenes are more than that: they're positively outstanding. Several times I found myself picking my jaw up off the ground as an amazing CG cut-scene delivered a major plot twist or turned the game in a totally different direction. If the CG movie delivered at the conclusion to the human campaign doesn't impress you, you're a lost cause. Go play NetHack, or better yet, stay away from computers all together and take up knitting. We're sure you'll find enjoyment in that. . .

Like most Blizzard titles before it, multiplayer in Reign of Chaos revolves around Battle.Net, where the usual features such as individual ladders, team ladders, chat and the like are to be found. One nice Battle.Net addition is Anonymous Matchmaking (AMM). With a single click, AMM will find a player with experience roughly equivalent to your own and throw you both into battle. Also worth noting is the 'friends' system, which allows you to keep track of, well, your Warcraft III playing friends. The fact that Warcraft III's 'namespace' is separate from the rest of Battle.Net means that as far as Warcraft III is concerned, there are no pre-existing Battle.Net accounts and thus no nicknames are currently taken. For those times when Battle.Net is down or too laggy to play on (rather frequently, or so we gather), Reign of Chaos also supports LAN play via TCP/IP. Unfortunately direct TCP/IP gameplay over the Internet is unsupported, however it should be possible for those of you willing to put in a little research on VPNs and the BnetD project.

Build a world of your own

When you've finished the single player aspect of Reign of Chaos and played every included custom map to death, you'll eventually come across the World Editor.

Warcraft III's World Editor is extensive and could take up a two-page review by itself. The Editor's real power becomes apparent when you create maps that are more than just your boring old melee, all in brawl type scenarios. For everything other than melee game types, map creation in Warcraft III revolves around triggers. There are triggers for almost anything you can think of, from a unit entering a certain area, through to a Hero levelling up, or the current time in the game's day/night cycle. Each trigger consists of events, conditions and actions. An example trigger would be an in-game cinematic set to play if the Hero didn't reach a certain point on the map within a certain time. The trigger event here is the time of day, the condition is your Hero unit entering the designated region, and the action is the cinematic being played. Other aspects of the world editor include the ability to import custom unit sounds and music in the form of WAV and MP3 files (battling the Horde to the sweet strains of The Tea Party, mmm. . .), the ability to edit statistics and attributes for different unit types, and the ability to manipulate cinematic cameras to produce your own in-game cut-scenes.

Reign of Chaos is a brilliant game: gorgeous graphics, addictive gameplay, immersive storyline and the promise of endless challenges via the extensive World Editor make this a title you cannot miss. Sell your dog, sell your soul – hell, sell your siblings if you must! Do whatever it takes to ensure you get your copy and can follow the Humans, the Elves and the Orcs as they attempt to abandon age-old prejudices and join against the malevolent evil that threatens to destroy them all.

9.5/10

GAME DETAILS

FOR: Immersive storyline; gorgeous graphics and highly addictive gameplay.
AGAINST: Highly addictive gameplay; limited camera angles.
REQUIREMENTS: 400MHz CPU; 128MB RAM; 700MB HDD space; 8MB 3D graphics card.
RECOMMENDED: 600MHz CPU; 256MB RAM; 32MB 3D graphics card.
SOUND APIs: EAX2; Miles Emulated 3D; Dolby Surround VIDEO APIs: Direct3D, OpenGL
DEVELOPER: Blizzard Entertainment www.blizzard.com
PUBLISHER: Vivendi Universal www.vivendi.com
DISTRIBUTOR: Vivendi Universal www.vivendi.com
PHONE: Vivendi Universal (02) 9904 4533

The Elder Scrolls III: Morrowind

John Gillooly gasps at the shiniest game water ever.

atomic HOT

ABOVE. Dawn, erm. . . dawns on a Netch ranch

ABOVE: Dumner campfire games are nasty

ABOVE: 'Feel the might of my magic!'

There is an unwritten law of game design that says RPGs aren't meant to look this amazing. We all know that the funky innovative next generation 3D engines are the domain of the First Person Shooter, not something that involves hardcore inventory management and the need to actually read things. And yet, The Elder Scrolls III: Morrowind is perhaps the best looking game to grace our PC screens.

Thanks in a big part to the fact that it will also be appearing on Xbox, it makes good use of DirectX 8 to provide a rare unforgettable gaming experience. The Elder Scrolls series has always raised the bar for RPGs, with many hardened Swordsmen going teary when games like Daggerfall are mentioned, and Morrowind continues the trend by providing an amazing single player Roleplaying experience.

The game begins with your arrival by prison transport ship at the township of Scyda Neen, on the island of Morrowind. After a comprehensive character creation process, tailored to cope for both the veteran and newbie alike, you set forth into the world – your only instructions are to take a package north to the town of Balmora.

While the main quest is an epic tale, the peripheral touches show just how much a labour of love the development of Morrowind has been. In even the most obscure corners of the island you will find yourself running into characters that require assistance, be they only recently sober, almost naked barbarians, or strange robed figures that suddenly plummet from the clouds.

No matter which direction you wish to push your character, there are ample side quests and storylines. You can take the traditional spellcasting or swordswinging paths to triumph, or try your hand at thievery or some similarly unconventional pursuit.

Control is by the familiar keyboard and mouselook system that Bethesda invented many years ago and is now the default method for FPS control. Right clicking brings up your inventory, character stats, world map and spell list, while the left mouse button is used for spellcasting, weapon wielding and other means of worldy interaction.

Combat is very action focused, with hand-to-hand weapons all having three possible attacks. Each weapon type has different damage ratings for each attack so care needs to be taken in the heat of combat to use your weaponry properly. Projectile weapons are simpler to use, but do follow simple rules of ballistics, and adjustment needs to be made when shooting arrows over long distances.

There is a wide range of spells available for use by the magically inclined, from the useful to the wacky and covering six major schools of magic. The spells sit alongside the usual assortment of potions, scrolls and enchanted items.

Skill development is tied heavily to usage, so that every time you perform an action that involves a skill such as blocking or spellcasting then your experience in it increases. After time you will find yourself levelling up and you'll be able to develop your core character attributes such as strength or personality.

While the game is already well featured and highly polished, Bethesda has included a high quality modding utility, enabling easy creation of plug-ins to the main game. This function has already been embraced by the community, which has led to an ever spiralling number of them being posted on various Websites.

The major downside to Morrowind is that it places a huge demand on your system resources. In towns the game's framerate will rarely climb above 30fps, even on the most bleeding edge of systems. Of course, this is not as much of an issue as it would be in a First Person Shooter, and the sheer magnitude and beauty of Morrowind means it is easily forgiven, but it will put off many gamers.

Morrowind is a rare gem: it's good-looking, deep, and it demonstrates an attention to detail that is rare nowadays. The history of RPGs is littered with games like this that failed because of bugginess or sheer over-ambition, but fortunately Bethesda has managed to avoid these things. Despite the hefty system requirements and low frame rates, Morrowind is an experience that should not be missed.

9/10

GAME DETAILS

FOR: Huge, open-ended gameplay; gorgeous graphics; roleplaying galore
AGAINST: Low frame rates; hefty system requirements
REQUIREMENTS: 500MHz CPU; 256MB RAM; 32MB 3D card; 1GB HDD
RECOMMENDED: 1.2GHz CPU; 256MB RAM; 64MB DirectX 8 compliant 3D card
SOUND APIs: Direct Sound **VIDEO APIs:** Direct3D
DEVELOPER: Bethesda Softworks www.morrowind.com
PUBLISHER: Bethesda Softworks www.morrowind.com
DISTRIBUTOR: Electronics Boutique www.ebgames.com
PHONE: N/A

Yamaha TSS-1.
Go inside and play.

Yamaha brings the excitement and realism of large scale movie cinemas to your home. The TSS-1 is the only multi-channel PC Home Theatre System to feature both Dolby Digital and DTS Surround formats.

Perfect for console games and movies. Just add a DVD Player, PlayStation 2™, XBox™ or GameCube™ for maximum enjoyment. Recommended retail price $449.

For a brochure or further information on the TSS-1, call **1800 682 705** or visit **www.global.yamaha.com**

YAMAHA

THE TSS-1 IS NOW AVAILABLE AT THE FOLLOWING PARTICIPATING STORES:

NSW/ACT: Harris Technology, Harvey Norman, Miranda Hi Fi, Canberra; Sydney Hi Fi – selected stores; The Max Home Entertainment; Worldwide Appliances ; **VIC:** Bayswater Bulk, Brashs, Harris Technology, Harvey Norman; **QLD/SA/WA:** Harvey Norman and leading computer stores, Australia wide.

DIGITAL dts SURROUND

DOLBY DIGITAL

DOLBY SURROUND PRO • LOGIC

Active Servo Technology

Age of Wonders II: The Wizards Throne

Putting on a pointy hat and saving Merlin's life is all in a day's work for Des McNicholas.

ABOVE: 'Let us in – it'll save so much time!'

ABOVE: 'Right then, you want a flame war?'

ABOVE: Merlin's visit to LegoLand was uneventful

Turn-based strategy titles have re-emerged with a vengeance in the last few months: improved graphics and smarter AI are tarting up a genre that had become a little tired when compared to the host of real-time titles.

AOWII manages to overcome most of the traditional turn-based interface and combat problems in a game that also sports better than average graphics, a decent story, and a solid pace. It's not perfect, but AOWII is the first turn-based strategy title in a long time able to challenge the RTS stranglehold.

Players are thrown overboard into the role of Merlin, an emerging wizard whose life is saved by magical old-hand Gabriel. Gabriel presided over the Circle of Wizards at Evermore, until the other wizards decided to carve up the world for themselves. Each is linked to one of the spheres of power: Fire, Earth, Air, Water, Life and Death, and Merlin's job is to master each sphere and force the rebels to restore order. It's a well-told story, spanning 18 campaign scenarios, 24 customisable single player missions, and multiplay via LAN, Internet and PBEM (Play By Email). A map editor is included.

As expected, victory in AOWII is achieved by balancing the competing demands of resource development, construction, tactics and skills improvement. While the concept is certainly nothing new, developer Triumph Studios has introduced enough refinements and innovations to make AOWII far less ponderous than some similar titles, allowing players to focus on the bigger picture while the detail takes care of itself to a fair degree. Construction, in particular, has been simplified over the original, improved by an intuitive interface, less complex build trees, and a largely automated research process. Similarly, resource gathering is incidental rather than cumbersome, and can be supplemented by a little looting and pillaging.

Triumph's greatest triumph (sorry!) is undoubtedly found in the use of zones of influence, which allow exploration parties operating within Merlin's range to be supported by magical spells and general orders. AOWII uses wizard's towers and nodes to extend the range of all wizards in a scenario, making them a major target for all sides. In addition, Heroes can be recruited, each of which carries a small area of influence through which wizards can also channel their powers to support parties outside of their normal range. The result is a far greater chance to influence far-flung events, as well as to quickly take the action into enemy territory – particularly when combined with the handy teleporters scattered throughout the environment.

Combat is often poorly implemented in turn-based strategy, but AOWII does a fairly good job of introducing a genuine tactical experience into the game. Players are given the opportunity to take command personally or leave it up to the AI, and the combat interface is straightforward and well presented. Units can be moved to positions of advantage, and the opportunity to use magic or ranged fire prior to close combat allows for some interesting strategies. That said, it remains essentially based on individual combat rather than group actions, and damage seems to be inconsistently applied at times. The new graphics engine helps a great deal, with terrain features and fortifications providing a significant advantage to defending troops, and a good mix of unit types is available.

AOWII has a simple diplomacy system that adds a great deal to the overall single-player experience. Game scenarios vary from two to eight opponents, with the larger maps offering plenty of surprises and a wide variety of terrain to fight over. Alliances are easily forged and broken, but the AI is unforgiving once betrayed. Similarly, independent parties can be paid to join the forces of good, and swapping units between groups (a major hassle in some games) is a very simple process. The overall situation is updated via an ongoing text commentary, and key decision points are highlighted on screen along with occasional advice from the grand old Wizard Gabriel.

Age of Wonders II: The Wizards Throne is a worthy sequel to the original and easily the best turn-based title released this year.

8/10

GAME DETAILS

FOR: Good combat interface, excellent control system and solid graphics.
AGAINST: Things can get a little confusing at times; some combat results are inconsistent.
REQUIREMENTS: Pentium II 300; 64MB RAM; 500MB HDD; 4MB DirectX video card.
RECOMMENDED: Pentium III 450; 128MB RAM; 16MB video card.
SOUND APIs: Direct Sound **VIDEO APIs:** Direct3D
DEVELOPER: Triumph Studios www.aow2.godgames.com
PUBLISHER: Take2 Interactive www.take2games.com
DISTRIBUTOR: Take2 Interactive www.take2games.com
PHONE: Take2 Interactive (02) 9482 3455

PlayStation.2

TAKE SOMEONE SPECIAL OUT

NO.1

London New York Paris Berlin Milan

DO YOU KNOW A GOOD SHOOTING GAME WHEN YOU SMELL IT?
YOU KNOW, THE TYPE THAT ISN'T SIMPLY COSMETIC?
WELCOME TO ENDGAME...

ASSUMING THE ROLE OF JADE, YOU MUST UNCOVER AND DEFEAT THE EURODREAM CONSPIRACY THAT THREATENS THE ENTIRE FUTURE. JUST ONE WHIFF OF ENDGAME AND YOU'LL BE TOTALLY CAPTIVATED.

"...WAY AHEAD OF ITS PAINFULLY LINEAR COMPETITORS" PlayStation.2 OFFICIAL MAGAZINE-UK

www.empireinteractive.com

Compatible with G-con2 G-con45

ENDGAME © 2001 Empire Interactive Europe Ltd. Game concept and creation by Cunning Developments.
ENDGAME, Empire Interactive and the E logo are trademarks of Empire Interactive Europe Ltd. All Rights Reserved.
G-Con45™ & © 1996 NAMCO LTD., ALL RIGHTS RESERVED. G-con™2 & © 2000 NAMCO LTD., ALL RIGHTS RESERVED.
"PS" and "PlayStation" are registered trademarks of Sony Computer Entertainment Inc. All Rights Reserved.

M15+

EMPIRE INTERACTIVE

Final Fantasy X

atomic HOT

It's good looking, but how does this fantasy play? Des McNicholas enters the fray.

ABOVE: Suspicious characters on a grassy knoll

ABOVE: Turn that frown upside down!

ABOVE: It wouldn't be FF without pretty lights

The Final Fantasy series is undoubtedly an icon of the video game industry, drawing as many smiles and wistful sighs as Elite, Jazz Jackrabbit and the original Wolfenstein. Arguably doing more to take Japanese youth and cinematic culture to the world than just about anything else, the Final Fantasy games have demonstrated consistently high (mostly) production standards, deep stories, thunderous soundtracks and beautiful characters. Final Fantasy X is no exception, and it may well lay claim to being the best in the series. As expected, FFX is a formulaic title that bends the fine line between film and game, but the balance has never been better and it has enough in the way of new features to warrant the hype.

Tidus the 'heroic blitzball superstar' is the unlikely hero this time around. As a guy who spends most of his time chatting up girls and sticking his head underwater in a cross between water polo, rugby and Aussie Rules, Tidus is understandably surprised when the his city is destroyed without warning and he's sucked through a time vortex to a future in the land of Spira. Along with a few old friends and some new pals, Tidus faces up to the mysterious entity known as 'Sin' in an epic quest spanning huge maps, some great environments, and the odd law of space and time. His long lost father is hidden in the background somewhere as well, and the chance to play blitzball pops up along the way. FFX is so well crafted that it's difficult to break it down into its various elements.

It looks absolutely stunning particularly during the 40 minutes or so of cinema-style cut scenes, with just about everything done on an epic scale. Despite being let down by slightly below par animations and some dodgy lip-syncing, the characters are exquisitely modelled in an 'interesting' array of fashions, with the franchise's traditional wide eyes, big breasts and flawless features.

In a departure from usual practice, voice actors have been used throughout FFX to good effect, and the translation to English has been handled well.

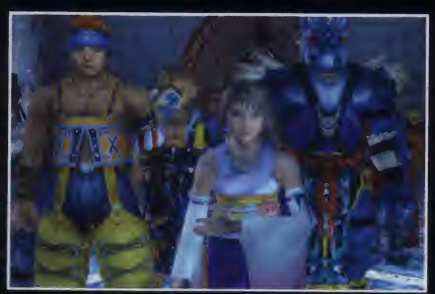
A decent control system and challenging advancement options are essential in a game that relies so much on the use of cut-scenes for plot development, or players will quickly lose interest in the relatively small degree of interaction on offer. FFX has a simple (if not wholly intuitive) interface that does a good job of managing the host of in-game options and the complexities of controlling groups, and the on-screen mini map keeps things moving in the right direction. Just as importantly, characters can advance through FFX's new Sphere Grid, which allows players to choose from a range of development options and follow numerous branches and sequels. The Sphere Grid can be accessed regularly, and points earned in battle can be used to improve magic or fighting skills.

Good looks aside, FFX's key achievement lies in the area of combat: the days of useless party members are gone at last, thanks to the simple innovation of allowing rotations between the active party and hangers-on at the push of a button. Aside from the obvious tactical advantages (in that the force can be quickly tailored to meet a specific threat) this approach allows any character involved in a battle – regardless of how long – to share in the rewards. The result is that all characters can be developed to provide a genuinely useful party, and party members are worth the effort involved in upgrading their skills. It's an excellent system, and one that's likely to appear in various guises in future RPGs.

FFX is an exceptional title that players will either love or hate: love because of the terrific environments and cinema-style presentation; or hate because of the incessant cut-scenes, relatively short bursts of interaction, and the fact that Tidus only wears half a pair of trousers. Either way, Final Fantasy X has unquestionably high production values and remains a fitting end (reportedly) to a fine series that also manages to introduce some useful innovations for the genre as a whole.

Final Fantasy X offers days of immersion, incorporating RPG action, combat, sports and the occasional unnecessary puzzle. Even sceptics will find it difficult to resist being drawn into Spira's sad tale.

9/10



GAME DETAILS

FOR: Excellent visual effects and fine camera work. A compelling story, and a first-rate combat system.

AGAINST: Very linear, plenty of waiting around, and the odd control problem. Too many cut-scenes break the gameplay rhythm.

DEVELOPER: Squaresoft www.square-europe.com
PUBLISHER: Sony Computer Entertainment www.scee.com.au
DISTRIBUTOR: Sony Computer Entertainment www.scee.com.au
PHONE: Sony Computer Entertainment (02) 9324 9500

"TEAM FACTOR LOOKS SET TO DELIVER A GREATER LEVEL OF TACTICAL BATTLES THAN ANY TEAM-BASED SHOOTER ON THE MARKET" PC GAMEPLAY

TEAM FACTOR

STRATEGY, STRENGTH AND STEALTH

TEAM FACTOR BRINGS THE WORLD OF THE COMMANDO TO LIFE LIKE NEVER BEFORE, WITH UP TO THREE SPECIAL FORCES UNITS IN THE THEATRE AT THE SAME TIME. UP TO THIRTY PLAYERS ON INTERNET PLAY AND MANY MORE IN LAN MULTIPLAYER MODE.

DEVELOP YOUR SOLDIER INTO THE BEST. CHOOSE FROM FOUR SPECIALISATIONS AND IMPROVE YOUR CHARACTER OVER SIX CRITERIA EVERY TIME YOU FINISH A MULTIPLAYER MISSION IN REALISTIC MODE. BUT BEWARE, YOUR STATS CAN GO DOWN AS WELL AS UP.

CHOOSE FROM 48 WEAPONS, BUT CHOOSE CAREFULLY, THEY WILL ONLY PERFORM TO REALISTIC RANGE & TECH SPEC. DRESS TO IMPRESS AS SPECNAZ, DELTA FORCE (AFGAN ISSUE) , SAS AND MANY MORE.

AI BOTS PROVIDE THE FUN IN SINGLE PLAYER MODE OR MAKE UP THE NUMBERS IN MULTIPLAYER MODE. THEY ARE DESIGNED TO REACT LIKE HUMAN PLAYERS, WITH DIFFERENT 'MOODS' AND WILL REACT ACCORDINGLY, SOMETIMES TRACKING A PLAYER OR SETTING UP AN AMBUSH ETC.

12 OPEN LEVELS TO START YOU OFF, INCLUDING THE MEKONG DELTA, AN ALPINE TRAIN CRASH, NORTH AMERICAN FARMSTEAD, AN ARAB TOWN AND MANY MORE, PLUS MORE FREE MAPS WILL BE AVAILABLE FOR DOWNLOAD SHORTLY.

Proudly Distributed by QV Software Pty Ltd. 79 Silverwater Rd, Silverwater, NSW, 2128.
P: (02) 9748 2555 F: (02) 9748 2990 W: www.qvsoftware.com.au E: sales@qvsoftware.com.au

QVS 7FX

Singularity SOFTWARE

Neverwinter Nights

Bioware fires an RPG at the RPG genre, and John Gillooly picks up the pieces.

atomic HOT

ABOVE: The Dungeon Master toolset in action

ABOVE: Oooh! Pixel shaded water!

ABOVE: The graphics engine has a sublime beauty

Whenever I hear the name Neverwinter Nights I instantly think of the abortive TV spin-off Baywatch Nights, in which David Hasselhoff played the slick lifeguard-by-day/crimefighter-by-night character, Mitch. This is unfortunate because Neverwinter Nights is the gaming antithesis of that sort of mindless cash grabbing televisual crap.

Neverwinter Nights has built a lot of expectations in the roleplaying community: it is a new game from Bioware, which is enough for most ardent RPGers to eagerly await its release, but there has been so much more promise than just a name developer being behind it. It is also the spiritual successor to the Baldurs Gate series, bears the official Dungeons and Dragons Forgotten Realms name, and is alleged to redefine how we look at not-so-massively multiplayer online RPGs.

The single player experience revolves around a strange plague that has struck the city of Neverwinter. You are charged with a quest to both cure the plague and work out its undoubtedly nefarious origins. After the obligatory bout of character creation, which like the entire game, is based upon the complex Dungeons and Dragons third edition rules, you are thrown into the beautifully 3D rendered city of Neverwinter and set out upon your journey of discovery.

Apart from the ability to hire a henchman to complement your skill set, the single player aspect of the game avoids the hefty party management that some recent RPGs have become all too focused with. Interaction with henchmen is simple and it really lets you focus on the development of your character, without wondering if the third Elf from the right has enough arrows in his quiver.

The single player campaign is deep and diverse, and sits somewhere between the excess open-endedness that marks games like Arcanum and the strict linearity of 'action' RPG titles like Dungeon Siege. It allows for enjoyable gaming, no matter which end of this RPG spectrum you come from.

Apart from some slight niggles with camera positioning when opening doors, Neverwinter Nights provides the player with fluid, flexible camera controls and the eye candy to back it up. After the hype that accompanied some recent RPG releases, it's nice to see Bioware has delivered a solid 3D engine that works seamlessly with the obviously complex underbelly of this game.

Neverwinter Nights shines in more than the 3D stakes: despite the inclusion of a deep, fun single player mode, underlying the game is a fully formed DIY multiplayer RPG engine. This not only means you can add your own maps – you can also pretty much create and administer a world all of your very own. The game ships with a very polished map and mission editor, and the multiplayer aspect of the game incorporates the ability to play as the Dungeon Master (DM). As DM you'll have real time control over events in the server, which allows for a much more dynamic and innovative gameplay experience compared to 99% of the non massively multiplayer RPGs on the market (Vampire: The Masquerade attempted to do a similar thing in a more primitive way). The DM toolset is impressive: events can be set using triggers, or for that personal make-your-friends-plot-your-early-death touch you can interact in real time. Say for example, they sneer at your attempts at the zombie ambush from hell, why not surprise them by dropping a whopping great dragon or twelve just around the next corner? That should reinstate the pecking order.

Multiplayer differs from the singleplayer mode in that it is party based, and allows up to 64 people per server. There are a variety of modes available, from action-based games to cooperative play of the single player campaign. The ease of modability should combine beautifully with the DM function and legions of Dungeons and Dragons fans to provide a lasting, ever evolving environment in which to exercise your online needs.

In the age where a lot of big promises are made about upcoming games, Neverwinter Nights is refreshing. It only lives up to the hype, it does it with a style and grace rarely seen nowadays. Combining a great single player campaign with a truly revolutionary take on multiplayer, this is a game whose presence will be felt for a fair while.

9.5/10

GAME DETAILS

FOR: Immersive single player, comprehensive multiplayer; beautiful sound and graphics.
AGAINST: Minor camera niggles.
REQUIREMENTS: 450MHz CPU; 128MB RAM; 1.2GB HDD.
RECOMMENDED: 32MB video card; 256MB RAM; 2GB HDD; broadband Internet connection.
SOUND APIs: DirectSound, EAX **VIDEO APIs:** OpenGL
DEVELOPER: Bioware www.bioware.com
PUBLISHER: Infogrames www.infogrames.com
DISTRIBUTOR: Gamenation www.gamenation.com.au
PHONE: Gamenation (02) 9808 6800

Medal of Honor: Frontline

Des McNicholas saves the free world with a control pad.

ABOVE: The Auckland Harbour Brudge

ABOVE: A hot sub mission

ABOVE: Where's Tom Hanks when you need him?

Still bathing in the glow of PC success with Allied Assault, the Medal of Honor series has returned to its console roots with a bang. Medal of Honor: Frontline doesn't bring anything particularly new to the FPS genre but as a console recreation of WWII action it will take a long time to beat. From hitting the beach at Omaha under intense fire in the first mission, to crossing French fields and capturing the bridges into Germany, MOHF is a stunning assault upon the senses combining elements of cinematography, real-world action, a fantastic sound track and a frantic pace.

While much of the action has clearly been drawn from Allied Assault, the 19 missions in MOHF have elements unique to the PS2 version, and are completed in different ways. U-Boat destruction, Ho-IX Jet stealing, the Nijmegen Bridge and infiltration are all on the list for Lieutenant Jimmy Patterson this time around, as players fight their way to, through and from a series of tough objectives with WWII ringing (very loudly) in their ears. Sadly, no two-player option is available – despite some maps that would lend themselves very nicely to a team effort – with the replay value resting instead on medals, and a host of historical footage and making-of features unlocked during the campaign.

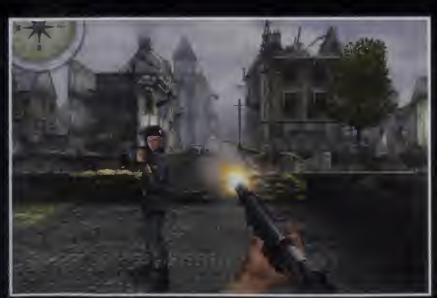
MOHF is played from an FPS perspective, with the odd squad-based(ish) challenge thrown in for good measure. For the most part, the war happens in the background, while players tackle a series of special missions in support of final victory. Even so, the sense of being part of something bigger is far stronger than in most FPS titles, as players are often called upon to help out other soldiers or undertake secondary objectives. The famous Omaha Beach level is probably the best example of such interaction, with an irate Captain bellowing orders and an emphasis on pushing the whole squad forward, but similar elements pop up throughout the game. Events are scripted and understandably linear at times, but MOHF uses sound, pace and special effects to hide it better than most.

EA has produced a simple interface that leaves plenty of room for focusing on the non-stop action filling every level. A combined compass and health meter keeps players on track and indicates the direction of hostile fire, and ammunition status is presented on the bottom right of the screen. Objectives and hints can be quickly accessed through the gamepad, and actions basically consist of moving, jumping, firing and crouching. Two pre-set control configurations are offered (both a little awkward), and players can also customise the setup to their own preferences. Unfortunately, the result is nowhere near as precise as Allied Assault on the PC, and the slow response becomes a little frustrating during close combat, particularly as games can't be saved during missions.

MOHF has a reasonable mix of weapons and equipment, including the M1 Garrand, two sniper rifles, the Thompson and M40 sub-machine guns, grenades, bazookas and shotguns. An aiming mode is included to improve accuracy (very useful, as the dual shock controller reacts to every bomb blast!), and a zoom option is available for sniper fire. Canteens, medical kits and surgeon's packs replenish health, with high health percentages improving mission scores. Explosives can also be used, as can abandoned machine guns, alarms, and disguises; while other special equipment becomes available as it's needed. The Resistance provides the occasional ride, but most of MOHF's huge levels are covered by the Mark 1 Boot and a strong pair of arms.

Getting the AI balance right is tricky in any FPS, and MOHF certainly lacks consistency. Although always aggressive, the enemy responses range from sensible squad tactics, in which they take cover, regroup and approach cautiously, all the way to inexplicably mad charges across open ground. While such variation in tactics might actually be realistic, it detracts from the obvious attention to detail shown in other aspects of the game, and the odd flash of enemy brilliance just highlights what might have been. Friendly AI is a similarly mixed bag, but the general sense of a bloody hard slog against aggressive defenders is well captured. Medal of Honor: Frontline is probably one of the best console FPSes so far.

8.5/10



GAME DETAILS

FOR: Stunning special effects, sound and gritty realism. Great range of missions in terrific locations depicting the worst hell holes of WWII.

AGAINST: Very linear at times, leading to player frustration completing missions; awkward controls; wildly inconsistent AI.

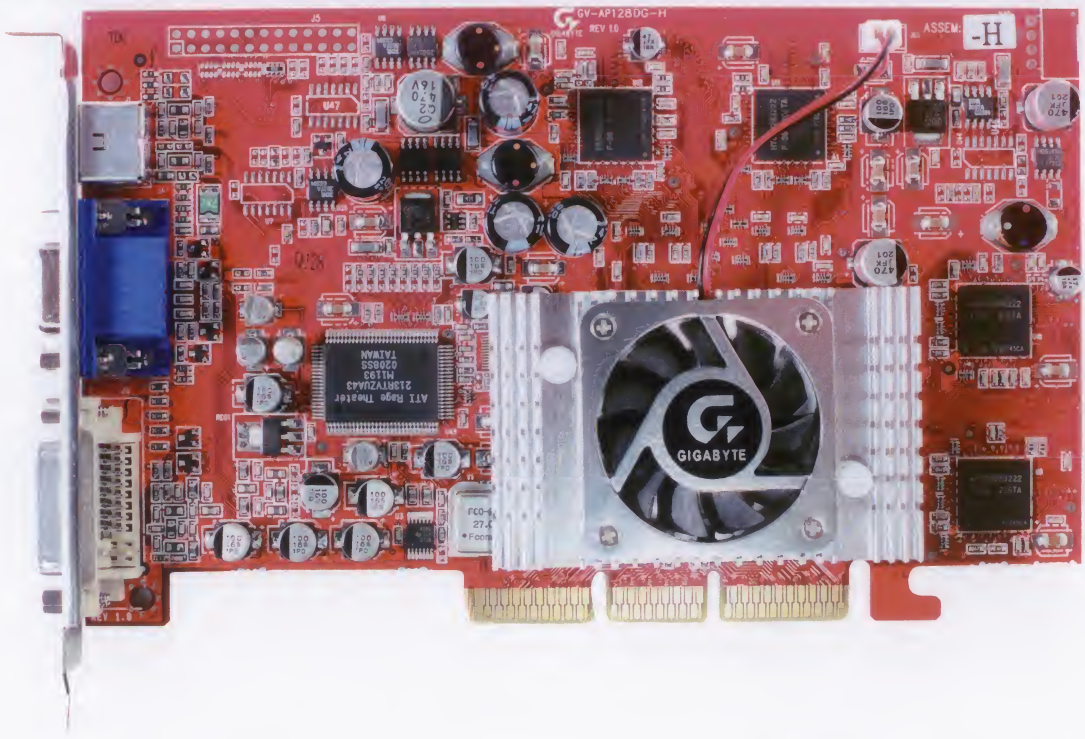
DEVELOPER: Electronic Arts www.eagames.com.au
PUBLISHER: Electronic Arts www.eagames.com.au
DISTRIBUTOR: Electronic Arts www.eagames.com.au
PHONE: Electronic Arts (02) 9264 8999

SUB ATOMIC

WIN A GIGABYTE 128MB RADEON 8500!

SUBSCRIBE TO ATOMIC AND YOU'LL HAVE A REASONABLY ATTRACTIVE CHANCE OF WINNING A GIGABYTE RADEON 8500. IF VIDEO CARDS WERE LIKE SOCCER TEAMS, NVIDIA WOULD BE ITALY AND ATI WOULD BE KOREA. KOREEEAAA!

SO, SHOW THE ITALIANS WHAT YOU REALLY THINK ABOUT THEIR SHOWPONY SHENANIGANS AND VOTE 1 KOREA, BY SUBSCRIBING TO ATOMIC.



By subscribing to Atomic you will save $22.40 over the course of a year. At AJB Publishing we strongly believe in the Australian spirit of free enterprise, which is personified by Australian small business, and typified by your local hard working and usually friendly Australian newsagent.

Obviously, taking out a subscription affects your newsagent in a negative manner, and while the benefits of an Atomic subscription clearly outweigh your moral imperative to support your local husband and wife newsagent team, we are still compelled to advise re-investing your savings back into additional newsagent magazine purchases.

We humbly suggest that you purchase additional copies of Atomic. This is our preferred option. These copies could be given to an Australian friend, accompanied by the statement: 'Dude, check it out, like. . . whoa!' Then, when they go: 'Dude, like, whoa, this fully rocks!', you can, like, go: 'Sick. . . who's yo daddy?' And they'll love you forever.

Ultimately the decision is yours. It's your $22.40 and we trust that you will invest it wisely. Just don't rush into anything. The natural high you will experience after becoming an Atomic subscriber often causes irrational behavior, and the dangers of spontaneous purchases of un-needed merchandise cannot be over-rated.

New: Gift subscriptions now available online @ www.atomicmpc.com.au & www.atomicmpc.com.nz

Issue 17 winner – Koolance case: L Sale, Parkwood QLD

Terms and Conditions of Entry. 1. The promoter is AJB Publishing Pty Ltd (ACN 083 063 914) of Unit 2-5/44-70 Rosehill Street, Redfern NSW 2016. Promotion period is from 9.00am on 18.07.02 until 12.00pm on 21.08.02. 2. Entry is open to residents of Australia and New Zealand. Management and employees of AJB Publishing Pty Ltd and their immediate families, and any advertising, marketing or promotional firms associated with this promotion are not eligible to enter. 3. Enter by posting or emailing forms to AJB Publishing Pty Ltd. 4. The draw will be held at the offices of AJB Publishing Pty Ltd at 5.00pm on 21.08.02. Winners will be notified by mail and published in Atomic 21. 5. The prizes are not transferable or exchangeable and cannot be taken as cash. 6. The judges' decision is final and no correspondence will be entered into. 7. The promoter reserves the right to publish the winner's name and suburb for promotional purposes. 8. All entries will become the property of AJB Publishing Pty Ltd.

WHY YES! I would love to adopt Atomic Magazine as part of my immediate family! Please find enclosed my dowry:
• Please allow up to 4–6 weeks for your first issue of Atomic.

Australia
☐ 1 year (12 issues) $49
☐ 2 years (24 issues) $80

New Zealand
☐ 1 year (12 issues) $NZ65
☐ 2 years (24 issues) $NZ110

Email: _____

Surname: Mr/Mrs/Miss/Ms _____

First name: _____

Address: _____

Country: _____ Postcode: _____

Phone: ( ) _____ Fax: ( ) _____

✔ Please tick method of payment

☐ Cheque/Money Order

Make payable to Atomic Magazine and post with this coupon to:
Australia – Atomic, Locked Bag 4275, Lane Cove DC NSW 2066, or fax (credit card only) to (02) 9817 4955.
NZ – Mercury Solutions, PO Box 24 013, Royal Oak, Auckland. or fax (credit card only) to (09) 625 3006.

☐ Bankcard ☐ MasterCard ☐ Visa ☐ AMEX

Expiry Date: _ _ / _ _

Card No.: _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

Cardholder's name: _____

Signature: _____ Date: _____

1337 7rOub|3s|-|007xOr

Daniel Rutter enjoys teaching as much as he likes helping. Through these pages, Dan is able to combine the two in a stupendous explosion of altruism. Dan enjoyed the opportunity to show off his von Neumann knowledge, so David wins the spunky Dilithium (www.dilithium.com.au) case. We can smell the happiness from here.

IOOTM: A *what* bottleneck?

After saving the hard-earned cash for many months I finally get enough together to buy a new beast, and I go to the local PC shop dreaming of my soon to be Athlon XP CPU. So, I'm placing my order and we get to the part about what RAM I want, and I say '512Mb DDR333 please'. I'm stunned - the guy behind the counter looks at me blankly and says he doesn't have any DDR333! Then he starts to mumble that the RAM I specifically requested would be pointless because of the von Neumann bottleneck, before swiftly trying to talk me into DDR266, of which he has plenty.

I cancelled my order. What is the von Neumann bottleneck he was talking about? And is DDR333 pointless? Is this shop guy a shonk or what?

David Mcauley

'All of the really nutty Socket A overclocking stars these days unlock and reduce their CPU multiplier, so they can manage a stupendous FSB'

All personal computers and most other computing devices use the 'von Neumann architecture', with separate storage and processing components connected by a data bus, and with programs and data sharing the same memory.

The 'von Neumann bottleneck' is what happens when processor speed outstrips the ability of the storage subsystem to supply the processor with data, and/or accept its output. This is a common problem for von Neumann machines, and it's why PCs contain so many caches, to smooth out throughput spikes and hold often-used data. The main reason why supercomputers cost so much is that they have very fast memory and very fat pipes between that memory and their processors; the processors themselves are not necessarily all that speedy.

Running 333MHz ('PC2700') DDR memory in a current model Athlon box is pretty much pointless, if the CPU bus is only 266MHz.

Both of these speeds, by the way, are *after* the clock-doubling that's done by the Double Data Rate memory design, and by the Athlon's EV6 CPU bus. The FSB you'll see in the BIOS display of a 266MHz-bus Athlon is the pre-doubling 133MHz.

But this isn't a von Neumann bottleneck — it's just a simple bus speed mismatch.

333MHz memory doesn't improve anything if it has to talk to the CPU through a 266MHz interface. The computer is subject to the von Neumann bottleneck *anyway* — the CPU's Level 1 and Level 2 cache wouldn't be necessary if it wasn't. But raising the RAM bus speed doesn't make that bottleneck any worse.

Now, on a system that lets you independently set processor and memory bus speeds (which is the sort of system you must have, if you can run a 266/333MHz split at all), you can goose up the processor FSB until it's closer to the memory speed, providing your CPU can take the stress.

On a motherboard that locks the processor and memory bus speeds together, 333MHz-rated DDR RAM just means that the RAM shouldn't be the limit for your overclocking.

Going from 133 to 166MHz CPU FSB (pre-doubling) is a 25% overclock, which is large, but far from unheard of.

All of the really nutty Socket A overclocking stars these days unlock and *reduce* their CPU multiplier, so they can manage a stupendous FSB — 50% higher FSB speeds are a weedy overclock by their standards. They either run their RAM well above PC2700 spec, or their memory bus is slower than their CPU one, which means their super-fast CPU genuinely *is* more starved for memory data than usual.

What all this means is that 333MHz-rated DDR memory is a perfectly sensible thing to buy, but only if you intend to run a similarly high CPU FSB. Otherwise it's wasted if your FSB is lower than the RAM bus speed.

Wanted: acronym decoder ring

It would be nice and helpful for users or amateur tweakers if *Atomic* could publish a detailed Computer Acronyms Dictionary in one of your issues.
I'm reading your BIOS Tweaking Guide (issue four) and I must say some of the acronyms really caught me.
Martyn

Well, we could try what you suggest, but there are *lots* of computer acronyms. Like, many thousands. Fortunately, there are some excellent Websites that help clear things up.

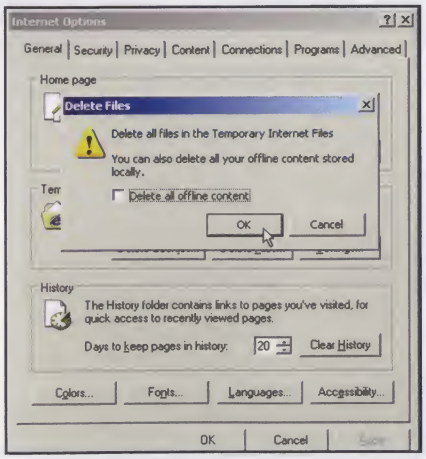
I suggest www.acronymfinder.com, for all sorts of acronyms, http://webopedia.internet.com, for general computing definitions, and http://foldoc.doc.ic.ac.uk, for the good old Jargon file, plus more.

No, really. Save it.

Why is it that after saving a few images in IE (right click -> save picture as), after a while JPEGs start being restricted to being saved as untitled BMPs?

It seems to happen through different Windows OSes and IE browser versions.

Any thoughts?
Daniel Butler



ABOVE: Out, out! You demons of Microsoft stupidity!

This is a bug that happens when the IE temp files directory is full. The same bug also makes it impossible to view the source of a Web page from IE.

Try deleting your Temporary Internet Files. Go to the Tools menu -> Internet Options tab -> Delete Files button -> OK button.

Wonky wheel

I have a Microsoft Sidewinder force feedback steering wheel with no Windows XP drivers, so this once great steering wheel will not perform properly under XP.

I have checked Guillemot and Logitech's Websites and they have written drivers for XP for their old steering wheels. Why won't Microsoft support its own products? I know Microsoft sold a lot of these wheels.

By the way, this is the second time that a Microsoft product has let me down. I had a Microsoft joystick that wouldn't work after I upgraded my computer to a 133MHz bus. Another throwaway Microsoft product.
Paul Morse

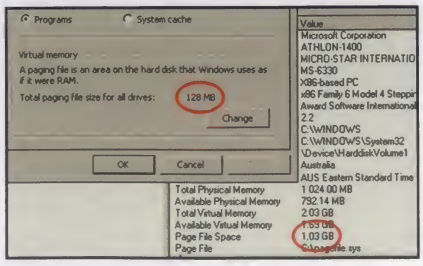
Drivers for the old Sidewinder wheel are built in to Windows XP. So, I think you'll find, are drivers for all of the other old Microsoft gameport sticks and wheels.

That said, it may still be impossible to make them work on your XP box, and the same goes for gameport controllers from other companies.

A gameport is a nasty old interface that, often, doesn't work properly on modern high speed PCs. Late model gameports and controllers have a digital interface grafted on top of the old analog one, but they still fall victim to timing problems when you change hardware, or even just change your operating system. USB game controllers don't have this problem, so you may have to upgrade your wheel, or wind back your OS.

Something here doesn't add up...

Please find attached a screen dump showing conflicting page file sizes. I thought I understood virtual memory, but after seeing this on screen I realise that I don't have a clue.



Why does System Info show a different page file size to that which I've set?
David Johnston

The 'Total paging file size for all drives' number is the *minimum* size of the page file (or files, in total). If the maximum size for one or more files is not the same as the minimum, then the page file can grow as needed, and won't necessarily be sized back down for some time after it grew. But the total size display will always show the minimum page size.

If you've got the drive space, you *should* allow the page file to grow; the alternative is out-of-memory errors.

Partition perplexity

As hard disk drives get bigger in capacity, I can't help but wonder what ratio is the best for partitioning. Does partitioning make any difference for various users like gamers, visual artists or simply office workers? What is the best and adequate capacity for an OS like Windows XP or ME to be stored in one single partition?
Martyn Mah

There's no reason for most users to put more than one partition on a hard drive these days. You need at least *one* partition, because that one partition is the thing you format to make the drive accessible. But you probably don't need any more.

When Microsoft operating system users hadn't yet been blessed with the FAT32 and NTFS filesystems, the biggest partition you could possibly create for DOS or Windows use was 2GB in size, and even that would have 32KB clusters. Clusters are the indivisible atomic unit of data storage on the drive, and when they're 32KB, every file wastes an average of 16 kilobytes of space, left over in the file's last cluster. To get the cluster size down to something more reasonable using FAT or FAT16 file systems, you had to make partitions smaller than 1GB, or even smaller than 512MB.

FAT32 and NTFS solve that problem. FAT32 still uses 32KB clusters if your partition's bigger than 32GB, but with that much space, who cares. NTFS cluster size is variable, but it'll only be 4KB on most drives. Both of these filesystems support partitions up to two terabytes (2048 gigabytes) in size.

If you want to boot multiple OSs, you're likely to want to put them on different partitions. There's no longer anything else that people commonly do, though, that requires more than one partition per physical drive.

USB or PS/2, that is the question

I currently have a Logitech MouseMan Dual Optical, which can operate in either USB or PS/2 mode. I was wondering which port would be better for playing games.

I have been told that with PS/2 corded devices, the reports per second (RPS) are 200; USB is static at 128. Could you help me decide whether USB or PS/2 is better?

Melvyn Low

ABOVE: "The MouseMan Dual Optical. For when one sensor just isn't enough."

You can wind up a PS/2 mouse's sample rate to a huge number with software or registry tweaks; it won't work that fast by default. USB sample rate is, indeed, fixed. Frankly, I doubt you'll be able to perceive any difference between sample rates above 100Hz. I can *just* believe that the very finest ninja twitch gamers — the ones that make a living playing games — can derive a real benefit from mouse sample rates far above their frame rate, and *very* far above their monitor refresh rate. But anything above 100Hz should be more than enough for pretty much everyone.

How fast is too fast?

I've been wondering for a long time now if burning at higher speeds actually reduces the quality and life expectancy of the data on the CD?

When I first bought my burner, I burnt at the full 6X (wOOt what a super speed...). Those few CDs are now either dead or takes ages to read. They spin round and round making fan noises until they're either rejected, or accepted very very slowly.

Does it matter what speed we burn at? And also what speed we read the CD at if we're copying from CD to CD?

William Ling

It *can* matter. But there are other variables to consider, mainly to do with the particular CD writer and media you're using.

Way back in the olden days, when CD writers were very expensive oddities, there were all sorts of eldritch problems with particular burners and particular media. Various combinations screwed up in nasty ways when writing data, audio, or both.

Today, an ordinary cheapo burner will probably work fine at a decent speed on ordinary cheapo media. But it's still easy to find exceptions to that rule. Generally, you shouldn't expect a cheap high speed CD writer to be able to write good discs at top speed if you feed it cheap media. Even pricey gold-standard Plextor burners aren't likely to produce consistent results at top speed on the cheapest and nastiest spindle-discs. But a top class writer *should* be able to manage top speed on fairly cheap discs.

Deterioration of discs over time is partly related to the original burn quality: if the data wasn't written very well in the first place, then a small loss of integrity can be enough to cause errors. But deterioration is mainly to do with the disc's treatment, rather than the disc quality.

Reading speed makes no difference for copying data discs, but it can make a big difference for audio ripping. Many cheaper CD-ROM drives and CD writers can't rip audio well at their top speed.

Stripey drives

Can you please tell me how I can software raid_0 my hard drive using XP Pro? Is there a program built into the operating system itself that allows you to do this?

Andre

WinXP Pro doesn't have what you'd call a robust software RAID implementation (Microsoft only gives you that with the expensive Server versions of its NT-series OSes...), but stripe-sets, it can do.

Go to Control Panel -> Administrative Tools -> Computer Management, press F1 for help in Microsoft Management Console, and do a search for 'striped'. It's pretty straightforward.

You will, of course, need more than one hard drive if you want a striped volume to achieve anything that an unstriped one wouldn't.

Athlon: Threat or menace?

I am ready to upgrade from my old Celeron system to an Athlon XP, VIA KT266A setup. I have been reading about how great AMD systems are, with the best price for performance, but when I talk to my local computer dealers, most of them say they have had too many problems with them ('high failure rates', and so on) and don't stock them anymore.

Should I instead go for a Pentium 4 system for safety, even though it's probably more expensive?

Stephen Mott

Yes, there's dodgy Socket A gear out there. Buy a dirt cheap motherboard and you're likely to have problems, especially if you also get cheap RAM, a cheap CPU cooler, a cheap power supply, and so on. None of that's AMD's fault, though.

Get a good Socket A motherboard from one of the big names (Asus, Abit, AOpen, MSI; maybe Epox or Tyan if you're feeling adventurous), make sure the rest of your components are decent quality too (don't buy your RAM down at the markets, and don't assume that a $50 case is going to come with a good quality PSU in it...), and you're not likely to have any more trouble with an AMD-based system than you will with an Intel-based one.

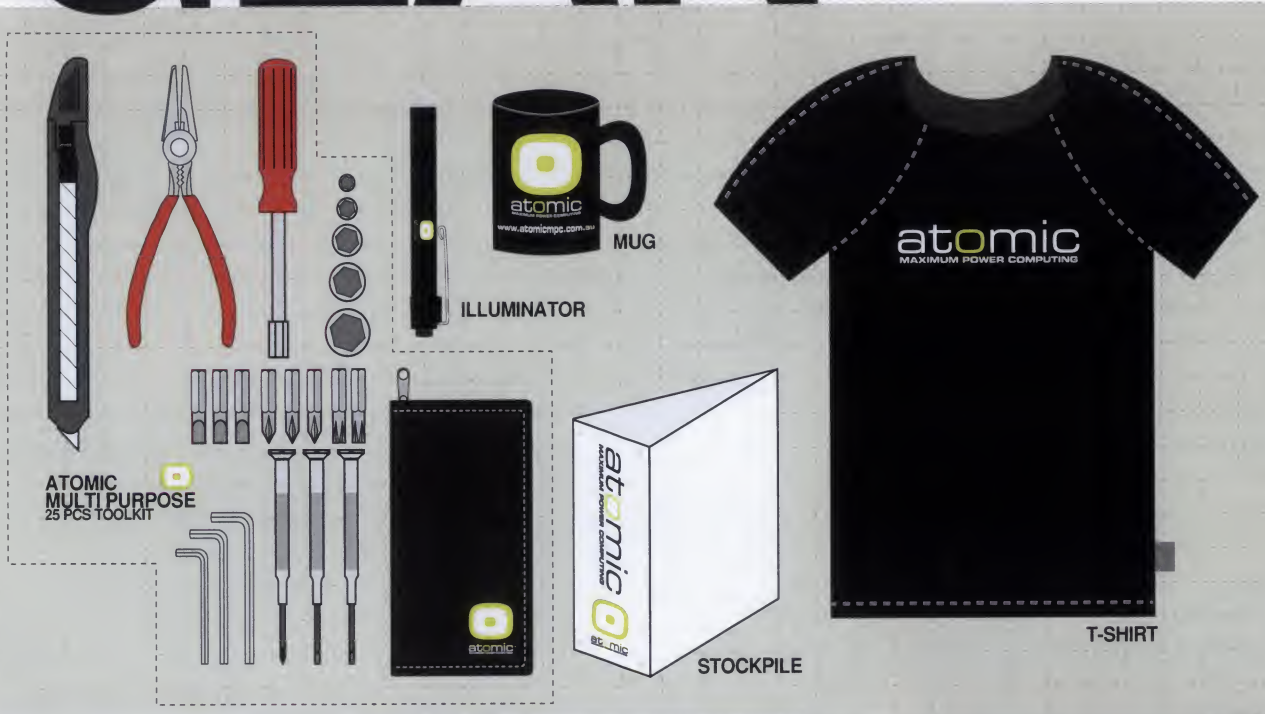
Brand new Socket A motherboards, especially the hot-rod super-tweaky overclockers'-special models, commonly have a quirk or three when they're new and still on their first BIOS revision. But more than a few Socket 478 boards have had the same sorts of problems; you hear less whinging about P4 problems on the newsgroups and in general, but that's because most of the tweakers buy the cheaper Athlon gear.

Buy something that was *the* hot new motherboard six to twelve months ago, and you'll probably get a good BIOS version out of the box.

As far as 'high failure rates' go — yes, a larger proportion of Socket A chips come back broken than do P4s. That's because Socket A CPUs are easier for a clumsy person to destroy when installing a CPU cooler than the P4s. The actual dead-on-arrival rate for Athlons and Durons is perfectly acceptably low, as far as I know.

If you're not too handy, get the shop to assemble your PC and you should have no problems.

GEAR



ATOMIC GEAR

Atomic Toolkit
Fix anything! $29.95;
subscriber price: $27.95

Atomic Mug
Drink up $10.95;
subscriber price $8.95

Atomic T-shirt
IT activewear $19.95;
subscriber price $17.95

Atomic Illuminator
See the light $17.95;
subscriber price $15.95

Atomic Stockpile
Nuclear waste $16.95;
subscriber price $14.95

Atomic CD Stash Master
Stack 'em and pack 'em $14.95;
subscriber price $12.95

Complete yourself and consume all the Atomicness you can handle. You could choose inferior, non-Atomic products or you could get your hands on the real thing. We have it on good authority that reality is a good thing, so what have you got to lose?

Item	Quantity	Amount
Atomic Toolkit		$
Atomic Illuminator		$
Atomic CD Stash Master		$
Atomic Stockpile		$
Atomic Mug		$
Atomic T-shirt (version 2.0) M/L/XL		$
Delivery charges (plus P+H): 1 item = $10; 2+ items = $15		$
Total		**$**

All prices include GST

Subscriber number:
Email:
Surname: Mr/Mrs/Miss/Ms
First name:
Address:
Country: Postcode:
Phone: ( ) Fax: ( )

✔ Please tick method of payment

☐ Cheque/Money Order
Make payable to Atomic Magazine and post with this coupon to:
Atomic, PO Box 275, Beaconsfield NSW 2014, or
fax (credit card only) to (02) 9817 4955.

☐ Bankcard ☐ MasterCard ☐ Visa

Card Expiry Date: ☐☐ / ☐☐

Card No.: ☐☐☐☐ ☐☐☐☐ ☐☐☐☐ ☐☐☐☐

Cardholder's Name:

Signature:

Date:

The Heavy Water Project: Phase 3 of 4

The Ultimate PC is now 2/3rds ultimate. Ron Prouse takes us closer to perfection this month, covering the all-important flashy and spinny bits.

As the Heavy Water Project evolves, its getting harder not to get too focussed on that case in particular, so from here on in there will be both a 'General' and 'Specific' modding section. . . such as the DigiDoc 5 Mod that I have always wanted to do! Hopefully this will mean that there is something of interest here for everyone, and whoever wins this case in the competition will have a slightly better understanding of the technological beauty they've won and will surely cherish!

Win the Ultimate PC!

The lovingly crafted, exquisite quality Heavy Water Project will end up being the Supreme PC, and it could end up being yours. As much as it pains us, we will be giving it away when it's built, to a very deserving winner. Enter by emailing your answer to win@atomicmpc.com.au with 'Heavy Water part 3' in the heading.

Q: What are the only two naturally occuring isotopes of Aluminium?

Wiring (pt2): Current events

If you read the last tutorial on wiring, you will remember where we left off – ready to wire up lighting and a BayBus. I will start off with the BayBus, as this involves the most work and if I run short on space the Lighting tutorial will be in the next issue! As you will see in the picture, there aren't really that many basic tools required for this mod, and about $2000 should cover it. . . Yeah, I'm kidding, but there are some tools needed that you may not have access to, and this is where you need to do a quick cost / need analysis, 'do I build or buy'?

If you doubt your skill-level then part of your decision should include the warranty that you get with an 'off the shelf' item. That said, the only way that you learn new skills is by 'having a go', and for those people it is the journey that matters, not the destination. Very Zen.

If you decide to buy, then you have other choices to make. At least one of the sponsors of this project, PC Case Gear, (03) 9572 3444, www.pccasegear.com/ can supply you with a DIY kit that will simply need some holes drilled in a 5.25" faceplate, or you can go with the more expensive, uber-tech solution, the DigiDoc 5, which has been supplied for the case project by Anyware Computer Accessories, (02) 9879 5788, www.anyware.com.au/.

If the tools needed are things that you will never use again, then my suggestion is to look at these alternatives if you need to save money right now, but if you're able to spare the cash, buy the tools now, because you'll definitely want them for all kinds of projects in the future. . . it's your call!

So what tools will you need?

My suggestions are:

- A 'spare' PSU (a cheap 250Watt generic) for bench-testing everything you build before it goes in your case;
- A multimeter, for fault-finding (Jaycar Cat. QM-1520) and a book from Jaycar called *Getting the Most From Your Multimeter*, (Cat. BB-7034, $12.95);
- A fine-tip soldering iron (Jaycar Cat. TS-1410);
- 0.71mm solder (Jaycar Cat. NS-3010);
- Side-cutter pliers (Jaycar Cat. TH-1882);
- A drill (drill press is even better) and drill-bits; and
- A hacksaw or jigsaw.

Considering that you probably have access to some of these handy tools already, the few extra bits and pieces won't cost you the Earth and you can probably find some bargains in the 'Wanted to Sell' classified ads in the local papers if you want to do it cheap. Alternatively, you may well uncover some tool goodies in the 'trademart' section of the Atomic forums. Regardless of which solution you choose, use the PowerPole from the last tutorial to neatly conceal all of the wiring.

Simple 7V-Off-12V BayBus – bi-polar BayBus?

A BayBus is something every modder will acquire at some time. The simplest type will provide additional control over mission-critical and accessory components, while at the other end of the scale you have the fully automated units with monitoring of just about everything from temperatures, fan speeds and even FSB settings.

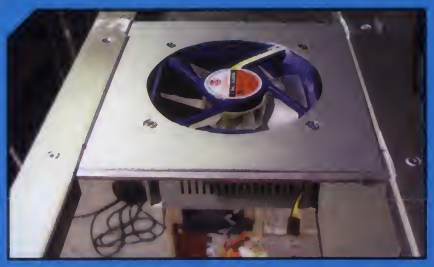
To build a simple BayBus you'll need the following:

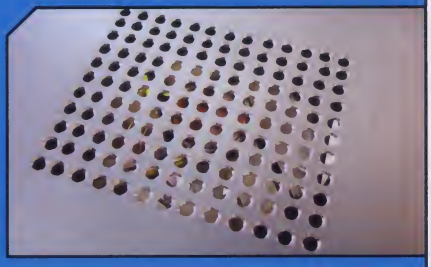
- 4-pole switch(s) (PCB rotary switch, Jaycar Cat. SR-1216);
- Switch Knob(s) (16mm Brushed Aluminium, Jaycar Cat. HK-7020);
- Molex Plug (M/F set, Dick Smith Cat. P 5120);
- 12V Red LED(s) (Jaycar Cat. SL-2640);
- LED Bezel(s) (Jaycar Cat. SL-2652);
- Colour-Coded Wire (Lots of it!) (Dick Smith Cat. W 224X);
- Terminal strips (Jaycar Cat. HM-3194);
- Heat shrink in suitable sizes; and
- A bay bezel and a wood or plastic off-cut as a template.

The use of a template is a 'must' when working with thin Aluminium faceplates, as the drill will often 'grab' the metal, spinning everything around and cutting off all of your fingers. . . well, maybe not, if you're careful.

You need to make sure that the template is a neat fit inside the faceplate so that it doesn't move around as each hole is being drilled. For this project I am using a 4mm thick plastic off-cut with all of the measuring up done on it. The drilling is done simultaneously through both layers, preferably into a piece of scrap wood or similar.

Top fan mod – blow your top I will. . . cut you up I must





While I was in a fan mood, there was another addition that needed to be made: a fan in the top of the case. A few months ago I reviewed a CoolerMaster ATC-210 box – by review I mean, 'tore it into 150 bits' – and discovered a nice touch that most other reviewers hadn't noticed, that the case-top was 'double-skinned'. That was why the top fan seemed to be attached without any visible retaining screws – it was bolted to the second, 'invisible' layer.

Pow! That idea went straight into the 'must replicate later' area of my brain, and has now been performed on Heavy Water. The first thing to do was drill out the four rivets that secure the top of the case, which will be replaced with threaded screws later.

The next step was to add two cross-brace supports to the top framework, and cut a piece of Aluminium sheet (left over from the window cut out) into the shape required. Why not just attach the plate to the existing rails?

As the top sits directly on them, the fan plate had to be a 'flush fit', or there would be a bulge when the fan was mounted. Even the fan screws had to be countersunk to fit properly!

The other reason was that the front cross-brace would also be used as the top mounting point for the PowerPole. Forward planning at all times modders!

Using the same method as in the first tutorial, I cut out the blowhole in the sheet metal and fitted a 92mm Enermax speed adjustable unit from the underside.

The ideal situation would be to have this fan running at the minimum 2000RPM, at which point it will be quieter than the PSU fans, but at least with the adjustable rheostat the airflow can be tailored to the conditions.

By having the finished metal surface slightly lower than the outer skin there should not be any excess vibration noise generated either.

There is a warning that needs to go with this mod. . .

Once you have removed the top, any case becomes much less rigid, but this is especially so when the case is constructed of Aluminium.

If you are working on a surface that is less than flat it is possible to rivet everything together with a slight twist in the chassis; a deformation that will only become obvious when you are bolting it all back together and nothing will line up.

If you are performing any sort of major structural work on any type of case, make sure that you keep checking the corner right angles with a set-square (across both planes) before drilling the rivet holes.

Now, you have probably been thinking, 'Great, a stealth fan mod. . . but now you are going to ruin it by putting a grill over the top!' Not so!

The CoolerMaster case has a punched-out grill in the outer layer, and that is the course that I followed too, well sort of! I had a vision of matching the top panel with the original air intakes on the front bezel, modified in dimensions to suit the larger 92mm diameter fan.

That's right: 143 individual 3/16" holes, all drilled by hand, each one slightly countersunk to give a smooth overall finish!

The front bezel holes were originally flat-cut, so they were given the countersinking process as well, to maintain consistency of style.

Now before you call me a hypocrite for knocking the rear fans for their pressed-grills, and then going on to make one of my own, consider the aesthetics issue: the rear fans are hardly, if ever, visible. As this mod is on the most obvious part of the case, therefore the 'look is of equal consideration to the efficiency in this particular situation.

As they always say, presentation is everything (whoever 'they' are?).

The switch has four central posts where the power enters the switch, labelled as A, B, C and D. Around the outside are 12 output points, and on a 4-pole variant (they also come in 1,2 and 3-pole) each of the inputs 'owns' three of them. So, if the A input was 12V DC, then outputs 1, 2 and 3 all have the potential of providing 12V power output. In the picture above, I have coloured-coded the four quadrants as if they were connected to a Molex plug like so: Yellow wire to A, so 1, 2 and 3 are 12V points; black to B and D, so 4, 5, 6 / 10, 11 and 12 are OV (ground for the yellow / red); and red to C, so 7, 8 and 9 are 5V rails.

The idea of keeping the two 'active' supplies separate is my personal preference.

On the right, you can see the front of the switch, which has a washer with a lug on it. Depending which of the holes that you select, you can change the number of switch positions available. In a 7V / OFF / 12V application you will use the hole marked 3.

This is where it gets tricky. . . :)

On switch position one, only outputs 1,4, 7 and 10 are connected.

On switch position two, only outputs 2, 5, 8 and 11 are connected. Etcetera.

By choosing which outputs that you use for each switch position, you can have four different output voltages, including 'off' points. So, to achieve a 7V-OFF-12V configuration we will have to wire up as follows:

Position 1 will be outputs 1 and 7 (potential difference 12V - 5V = 7V), position 2 will have no connections, and position 3 will be outputs 3 and 4 (12V and 'ground'). Make a point of 'nipping off' any of the terminals that you are not using as close to the plastic body as possible, to avoid any short-circuits or even cover the 'stumps' with non-conductive silicon if you are really paranoid. Simple really!

This picture shows the three steps to the process, with the finished holes on the left, the switch and bezel fitted in the middle, and the final fit-up on the right. Depending on how many switches that you intend using, divide the faceplate into X sections, and work out where the holes will need to be placed. I am incorporating one red LED for each switch to show its 'on' status; you might want to use different coloured LEDs per channel, have two rows of LEDs to indicate either 12 or 7V, or even use bi-coloured LEDs. Once you have worked out the positions for lights and switches, it's time to mark everything up and drill the holes through the resultant template and cover plate.

I recommend covering up the outside of the faceplate with masking tape to protect it, drill small (2.5mm) 'pilot' holes before progressing to a larger drill-bit, and do all of the drilling from the back to minimise any distortion to an Aluminium cover plate. When you have drilled the actual holes for the bezel and switch, remove any burrs by using a 1/2" drill-bit, manually. The bezels that I am using are about 5mm too long, so they will need to have the threaded-side filed down – attach them through the template with the nut fitted, file off the excess and then remove them. When you take them off, the nuts will clean up any threads damaged during filing.

When you fit the switch, make sure that the 'tagged' washer lug is still in the right hole (#3), and that the two washers are on the inside of the cover plate. The nut obviously goes on the outside. You'll need to cut down the plastic shaft to fit whatever style of knob you are using.

The first thing that will be obvious from this picture is that the Lian Li cover plates have standard DIN external dimensions, which means that anything that is going to fit inside or behind them needs to be made a little smaller. (That's a nice way of saying that I am going to grind a heap of the plastic off the original bezel!) Once you have removed the bezel, or in this case, removed all of the fans and wiring, it is time to start grinding or filing about 1.5mm off each side. What you basically have to do is remove the thickness of the cover plate from every side of the drive.

Two tips: Make sure that you take even amounts off each 'pair' of sides so that everything remains centred; and secondly, chamfer the leading (front) edges slightly so that the drive wedges in for a really firm fit inside the cover plate.

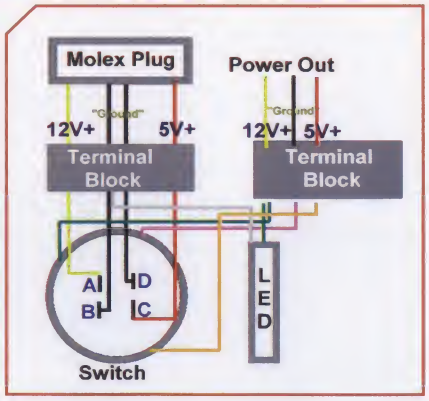
This is the gutsy part of this mod. Well, maybe not on a $40 HDD cooler, but if you do it to a $900 DVD/R you will soon see what I mean! Once you have ground the drive bezel down there is no turning back, unless you can acquire another front as a spare part. Good luck on that score – so proceed carefully!

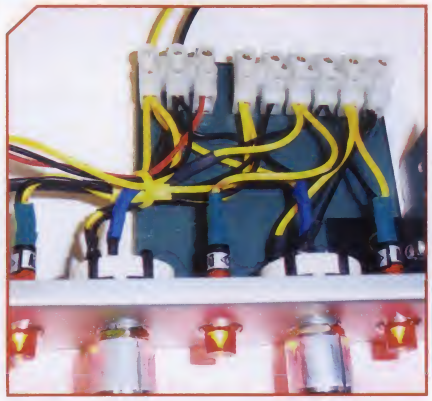
There is one other initial step that will depend on what you are modding, and that is removing the side tabs (the dog-leg shaped side brackets that hold the cover plates in position). If you are modding a drive unit that has provision to be screwed into the drive bays, then cut the tabs off about 5mm back from the front edge. If the component is something that can't be screwed in, like the DigiDoc or BayBus mod, then leave the tabs as they are to secure the final project into place.

Rear fan mod – let me breathe more freely!

Lian Li standard 'punched out' factory grills at the rear of the case don't offer the best ventilation. Compare the amount of restriction to airflow on the bottom grill against a standard wire fan grill, and you will see what I mean. If nothing else, the restriction would make the fan work harder, and therefore noisier, than a more 'free flow' of exhaust air.

Fixing this was very simple. I used the same methods outlined in the first tutorial and within two hours all four of the restrictive openings had been replaced with the better solution. While I was at it, I also replaced the relatively noisy Adda fans with Enermax speed adjustable, clear-blade units. The Enermax fans are noticeably quieter, even at their full speed, and the clear blades really add another dimension to the 'light show' out of the back of the case – bonus!





▲ It's time to get started on the Aluminium cover plate, so the first thing to do is cover up the 'visible' side with masking tape to protect it from getting scratched while you're working on it. The cover plate should now fit snugly inside the plate; now get a really sharp pencil and trace around the inside of the three holes. In the picture you will notice a weird looking tool: it's called a Nibbler (Jaycar Cat.TH-1768) and it is the most useful tool that I have ever bought when it comes to doing mods like this. It cuts 4mm x 2mm squares out of Aluminium, plastic and mild steel up to 18 gauge in thickness. . . and all it needs is a 1/4" hole to start from, similar to a jigsaw. It is a simple matter to run the Nibbler around the pencil mark and end up with a relatively smooth-edged hole. The other method that I have used is to drill a series of holes around the circumference, and then use a small diameter rasp to remove the metal between the drill-holes, or you could simply use a file to do the lot!

However you get there, the idea is to get to a point that looks something similar to the picture.

The next stage is to file the holes out to the correct shape, and then use progressively finer grades of Wet'n'Dry sandpaper to get them perfectly smooth. On the last grade of paper (usually 1200) you can use an Aluminium polish instead of water to give the rim of the hole a chrome effect. I suppose that is what you would call a rim polish. . .

Before assembling all of the parts back together and gluing the modified bezel into the cover plate (with 'Selley's 5-minute two-pack epoxy resin'), it is a good idea to give any visible beige patches a coat of flat silver paint, including the inside rails, because when you're done it makes everything look that much more professional.

▲ Don't look at the pic above and run away in a panic – it isn't as hard as it looks! Just wait until you get to see the real thing :)

Break it down into three sections:
(1) Four wires from a Molex plug into the centre of the switch via a terminal block (so that you can easily attach multiple switches);
(2) Three wires from the pins of the outer ring of the switch (that we worked out above) to another terminal block; and
(3) Two wires going from the LED to the yellow output terminal block and the black at the input terminal block (the yellow 12V output wire is 'live' in each powered configuration, and the ground will provide circuit continuity for the LED).

As the picture says, this is a singular schematic, so you will have to replicate it for every single switch in your BayBus.

My tip? Construct them and test them one at a time!

As I mentioned at the beginning, the Project case is using a DigiDoc5 for fan control, so I am going to use this particular component as a LightBus, switching three different groups of case lights.

Accordingly, these switches will all be two position (On/Off) 12 Volt output to activate the case lighting, so don't get confused if the following picture looks different to your own unit.

At the fan end, which is most likely the use you have in mind, connect the yellow wire to the positive, and the red and black wire to the negative.

Relax, I promise the red and the black will not/should not be active at the same time.

You will be checking that with your bench-test PSU and multimeter, right?

To power a FanBus (covered in the first tutorial) you will need to supply all four wires to a female Molex plug for it to be plugged into.

▲ Don't worry too much about replicating the pic – your BayBus will look slightly different! This wiring configuration is for 12V on/off switches only – the picture is just to show you an easy way to support and control all of those wires in an orderly manner. These switches are designed for circuit board or panel applications and therefore they are not equipped with wire yokes; the wires will need to be retained in some way to prevent the solder connections from taking all of the load.

Also note that every connection point has been carefully insulated with heat shrink.

On a Lian Li case the front bezel sticks out by 20mm, which means that the cover plate sides don't enter the case-body until after the 'dog-leg bend'. I have dealt with this by riveting an 'L' bracket to the cover plate on one side prior to the bend, and attaching a plastic off-cut to it. This gives me a 'floor' to screw the terminal blocks to.

Why have I only done this on one side? That way, the cover plate is still 'springy' enough to firmly clip in to the standard retaining slots. For retaining electrical connectors, such as the terminal blocks, I always use 3mm nylon screws and nuts to avoid possible short-circuits (Jaycar Cat. HP-0142 and HP-0146; JayCar also offers a really handy 'washer and nut combination', HP-0150).

There are two final points that are worth making. This type of BayBus will easily fit into a 3.5" bay if you only use two switches and are prepared to file down about 2mm off the top and bottom of the switches (for clearance). The second point is that you have the option of 'mixing up' the switch functions, but still retain a common appearance that matches.

IMHO rotary switches look so much cooler than toggles.

Cover plate modding – formal attire for your bezel

Admit it: this hard drive cooler is one of the most boring, beige things that you have ever seen, with about as much personality as an SBS 'World Movie' presenter on Valium, right?

If you could turn this into the sexiest air intake you have ever seen on an Aluminium case, would you be interested? Of course! Now read on. . .

About 18 months ago I bought my first Lian Li case and immediately became fixated with banishing all of my beige components behind the OEM cover plates. As time progressed, I started to mod all types of components so that they were encased in the brushed Aluminium covers, trying to make the front drives look like they had all been 'chiselled' out of a block of the stuff.

One of the first things to get this treatment was one of these HDD (Jaycar Cat. XC-5044) coolers and IMHO it is still one of the best looking semi-stealth mods I have done.

It is also the simplest, so therefore it's a great place to cut your teeth on the common techniques used to perform this mod on other components later. Let's walk through the process... this is what you will need:

- Three fan HDD cooler (Jaycar Cat. XC-5044);
- Various sized files and grades of sandpaper; and
- Aluminium (mag wheel) polish.

Optional

- Three red flashing 12V LEDs (Dick Smith Cat. Z4044);
- Clear acrylic sheet off-cut 3mm thick, 3mm diameter plastic welding rod;
- Clear 5mm heat shrink;
- Colour-coded wire (red and black);
- Molex Plug (M/F set – Dick Smith Cat. P 5120);
- Red tell-tale LED and bezel (Jaycar Cat. SL-2644); and
- Micro toggle switch (Jaycar Cat. ST-0300).

Why is this picture 'tacked' on to the end of the HDD bay cooler mod? Well, as I said at the beginning, the HDD mod is the simplest faceplate mod of the lot and the best way to acquire the skills needed to learn the common techniques used to perform this mod on other components. Once you've done that, you'll find this next mod a fairly natural and easy progression.

Many of you would be aware of the slot-load Pioneer DVD ROMs: I have a 105SZ in my main system, and it has performed without a hitch for the last 12-plus months.

Being a slot-load device, you don't have to worry about lining up the case-plate with a sliding tray and door, which is the hardest mod of this type – we will look at that in a separate tutorial.

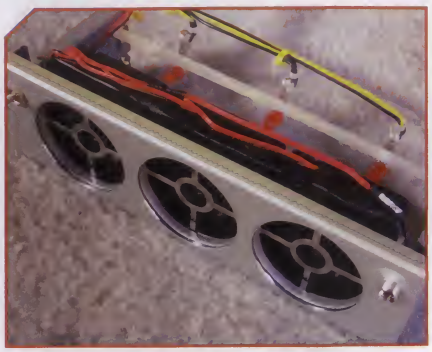
Rather than re-write all of the same instructions, it makes more sense to simply outline the extra steps, such as making sure that you remove exactly the same amount of plastic on the original bezel right across each side or the slot that you cut out will not be parallel to the DVD opening, the faceplate, or, in the worst case scenario, either!

There will also be quite a bit more of the original bezel showing with this mod, so there will be more to paint with flat silver including the eject button. The black felt material around the disc opening has to be masked up to keep the paint off of it.

On Heavy Water I have covered the front of the eject button with carbon fibre to match the Lian Li case trim.

To get the cut across the drive opening straight, wrap the sandpaper around a file or steel ruler, and try to keep in contact with as much of the slot opening as you can. Sand it diagonally to remove most of the inevitable 'waves' in the cut out.

Most of all, realise that this is a very labour-intensive modification, so take your time getting it right.



If you are looking to go that one step further, here is an idea that adds a cool effect for next to no cost: flashing red LEDs that are lined up with the fan centre so that they are basically invisible, but reflect through the fan blades. What I have done is used an off-cut of clear 4mm acrylic sheet as a 'bridge' between the two rails and drilled 3mm holes in line with the fan boss on the vertical plane. I cut some short lengths of clear plastic welding rod and glued these into the holes so that the ends of them lined up with the centre of each fan boss on the horizontal plane. The next step is easy, wire up the three flashing LEDs so that they are powered at all times from the male Molex connector, and attach them to the welding rod 'pegs' with clear heat shrink. Bend the LEDs at right angles to the pegs, so that the main field of light is directly focussed at the back of the fans. Secure the wires to the acrylic plate with zip-ties. The 'bridge' will have minimal impact on airflow and as everything is basically transparent the light can radiate through the whole area!

You have to see the effect to fully appreciate it :)

Another option is to fit an 'On/Off' micro toggle switch and tell-tale LED to the fans. Use the toggle to control the power line-in with the LED wired across the switch output line and the input 'ground' rail. I have fitted them to each top corner, but they look just as effective stacked on one side.

Addendum

Keep turning the pages until you hit number 92 – Dan Rutter has done us an LED tutorial that uses a new kind of high-intensity LED, which gives brilliant results.

DigiDoc5 Mod – FSB (Freakin' Sexy BayBus)

One of the best cooling control solutions ever made is the Macpower DigiDoc5. The DigiDoc not only monitors the status of up to eight fans (and temperature probes) at once, but it can also be set to turn them on and off at individually set temperatures!

The unit also monitors the 5V and 12V rail of the power supply, and has a warning beeper that makes you aware of any problems as they arise. When installed to its full potential the LCD displays a constant rolling read-out of temperatures, fan speeds and voltages.

But there's one drawback: it takes up a 5.25" bay. I've been wanting to try and fit a DigiDoc into a 3.5" bay for ages, I have had at least two spare floppy drives in every machine I have owned! The main thing that was stopping me was the risk factor. Could I afford to throw away a $150 item if I screwed it up? Could Anyware Computer Accessories afford it? Better than I could!

Step one was to pull it all to pieces, and measure everything up for fit. More planning! It turned out that my main concern, the circuit board (PCB), would just fit into the 3.5" cover plate width. Height was not an issue, as two 3.5" bays add up to more than one 5.25" bay.

The components that make up a DigiDoc are fairly compact: the aforementioned PCB and LCD module, a 40mm Sunon fan and grill, a plastic faceplate and the metal frame that includes a pair of rails to mount a 3.5" HDD. Oh, and about 300 metres of fan and temperature probe wiring.

I used a hacksaw to remove the 40mm fan and housing from the cover plate, and that was the point of no return – warranty voided immediately! The next step was to grind down enough of the remaining bezel so that it would fit inside the two stock Lian Li cover plates, once I had removed the 'lip' at the surface where they joined.

With the cover plates held together with the removable Lian FDD cage, it was a case of fitting the original bezel inside, and tracing around the cut outs for the buttons and screen. Keep checking for alignment of the top and bottom cover plates as they will move around quite a bit. Once I was sure of the fit, it was time for one last check of the positions of the buttons before drilling out some holes as the starting point for filing the button hole cut outs to final shape. You might be wondering how a file would ever fit into a 3mm hole, and the answer is. . . Jewellers' files. Yes, those tiny little 'needle sized' files that remove metal at about the same rate that oil-based enamel paint dries. Let me state that this is not a mod for someone with a lack of patience! As usual, I protected the cover plate with a layer of masking tape, but these files are so sharp at the points that I still managed to make a fine scratch near the top oval button.

About five solid hours of filing later, everything was lined up perfectly! The last thing to do before re-assembly was to paint the small strip of the old beige bezel that showed in the gap between the two cover plates. For this type of touch-up I use VHT brand 'Hi-temp Flat Aluminium'. It is a paint designed for exhaust headers on cars, and really has a 'raw' Aluminium finish. I wouldn't suggest painting a whole drive with it, I tried it once, and it looked scrappy.

While I filed away the hours, I was trying to think of a way to change the colour of the soft rubber buttons from beige to black. I decided that whatever I tried would either wear off or crack with use, so I considered it was better to just leave well enough alone. I'm glad that I did, because once the modded DigiDoc was fitted into the case I realised the power and reset buttons are almost the same colour, making the DigiDoc look much more of a 'factory-fit' item :)

Talk it up

Wandering through the Atomic Forums over the past month or so I have come across a few posts regarding some of the tutorial content from Issues 17 and 18.

If you want to talk to me about any of the things that I have written about in the series of Heavy Water Project tutorials, stick it in the 'Magazine – Comments' section, with 'rikk' in the subject line. . . even if I can't help, I bet that there is someone who can.

If you haven't ever been to www.atomicmpc.com.au/forum.asp then you will find that, thanks to the diverse knowledge-base of the Atomican Community, the AtomicMPC Forums will probably become your number one online destination for any PC-related issues – and the replies are fast, too.

While you're there, check out the section that contains all the extra pics that we couldn't fit in the mag. That way you can truly appreciate the beauty of the HWP, plus you'll get a further appreciation of my artistic and engineering skills. Makes you wonder – the winner of this baby is going to possess the hottest box ever. I'm jealous :)

Caselight II: Disco inferno

If anyone can light up your world, Dan Rutter is the man to do it. Forget neons and basic LED arrays — the latest high-power LEDs are blindin'.

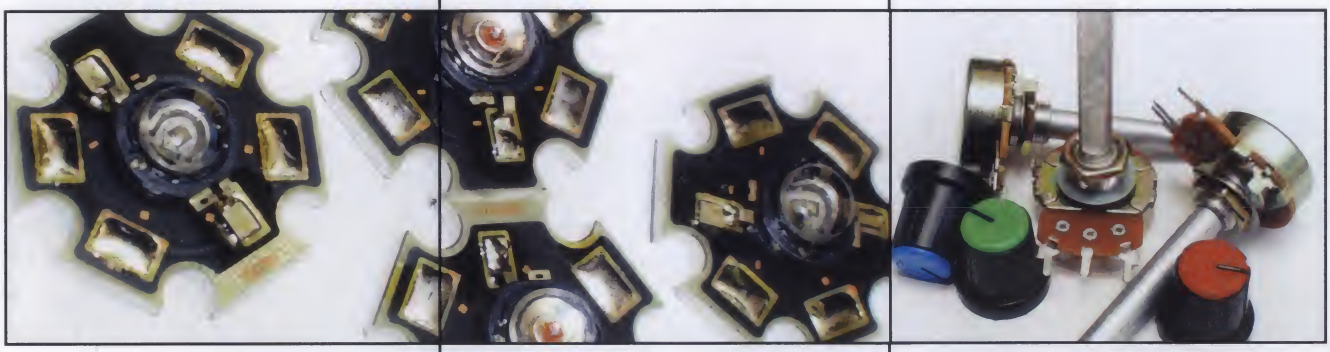
As those who read my caselight piece in *Atomic issue 12* will already know, Light Emitting Diodes (LEDs) have a lot going for them if you want zero-maintenance, long-life, high-efficiency and cheery-coloured lighting for your funkalicious window-sided computer.

The problem with using regular high intensity LEDs for case lighting is that you need an array of them to get an impressive amount of light. Therefore a fair amount of soldering is involved.

Fortunately, LEDs are getting much, *much* brighter, thanks to new super-high-power designs like Lumileds' Luxeon Stars.

URLs:

Lumileds, maker of Luxeon Stars: www.lumileds.com
Jaycar: www.jaycar.com.au
Mark Hannah Surplus Electronics (buy Luxeons here while you wait for an Australian dealer to emerge): www.markhannahsurplus.com
Tweakmonster: www.tweakmonster.com
PC Case Gear: www.pccasegear.com



ABOVE: The four Luxeons, including the two red-orange ones, still connected together, as they came from the factory.

Luxeon Stars don't look like normal LEDs: they've got a *much* bigger light-emitting die, and a *much* higher power rating to go with it. Even these first-generation Stars have a rated power up around one watt, versus about 0.1 watts for high power 5mm LEDs.

As well as giving you ten LEDs worth of brightness in one unit, Luxeon Stars are also easier to work with: unless you buy the LED-only 'Emitter' version, you'll get your Star on a little circuit board with four handy solder pads for connections. It's easy to make arrays, if you want to.

The circuit board also works as a heat sink: push a Luxeon Star to full power and it'll run warm.

If you cool them well enough, you can overdrive Stars easily, without killing them. So yes, these are caselights you can overclock.

These ones aren't the 'Star/O' variant, with focusing optics – they're wide-angle units, ideal for close range lighting. Lumileds kindly provided blue, green and 'red-orange' Stars for this project; the red-orange LEDs emit light further up the spectrum than normal red LEDs, which makes them more visible.

Electrically speaking, Luxeon Stars work the same way as normal LEDs – they're just beefier. You still need a series resistor to hold off thermal runaway, and you still have to connect them the right way around or they won't do anything. I dealt with all this in detail in *Issue 12's* LED caselight piece.

If you want to hook up one Star as a stand-alone caselight, it's dead easy to do it: a bit of fiddling revealed that you'll get the full rated 300 milliamp (mA) current through a green or blue Star with about six ohms of in-line resistance, if your supply is five volts.

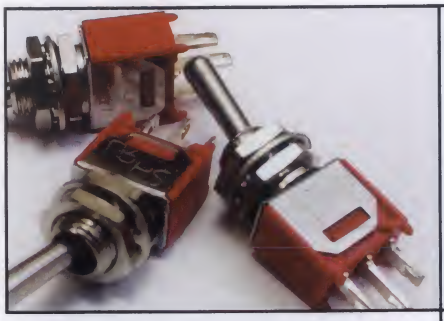
Even the red-orange Stars aren't as visible as green or blue, so I tried two red-oranges wired in parallel. They were happy from 5V at 600mA between them, with four ohms of in-line resistance.

Just making a wire with a light on the end wouldn't make for much of an article, though, so I built a fancier rig: red-orange, green and blue Stars (two reds, one each of the other colours), separately controllable, with on/off switches and dimmer knobs.

ABOVE: Potentiometers, and knobs to match, yours cheap from anywhere that sells electronic parts. Potentiometers come with long shafts for flexibility of installation. If you're putting them right behind a panel — as you probably will be, if you make a light like this one – then you have to cut the shaft shorter, or your knobs will be out on stalks and look silly. The shafts are plain Aluminium, and a junior hacksaw's perfectly adequate for cutting them.

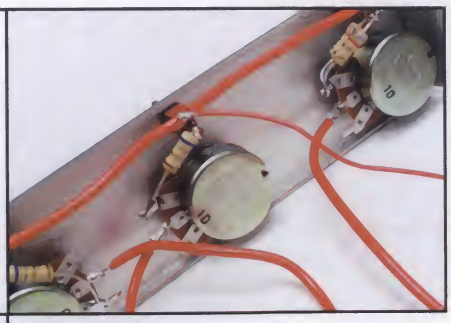
Getting a good dimmer action for a high power LED is tricky. The way to do it is to power the LED through a current limiting resistor and also put a potentiometer ('pot'; variable resistor) in series. The pot should be linear (rather than logarithmic) and its maximum resistance value should be high enough to make the LED very dim, without being so high that you only get a worthwhile brightness change over part of the pot's action range. The pot also needs to have a high enough power rating that it won't be toasted by the maximum power it has to dissipate.

I used three 500 ohm 1/2 watt pots, which aren't ideal dimmers – LED efficiency isn't linear, so the dimmer is a bit twitchy at the high brightness end – but work well enough. And they cost only a couple of bucks each from Jaycar.



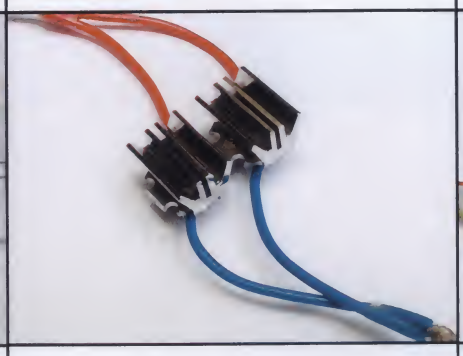
ABOVE: Plain single throw mini-switches are perfectly adequate for a task like this. If you need less than an amp of current handling – and for one or two Luxeons, that's all that flows – then there are tons of switches to choose from.

ABOVE: Tweakmonster RAMsinks, probably the finest you can buy. Made of copper, shiny-plated, and not much use at all for cooling RAM, (most RAM doesn't need cooling). The sinks make a nifty decoration, though, and work well on the back of a Luxeon Star. They're sold by PC Case Gear.

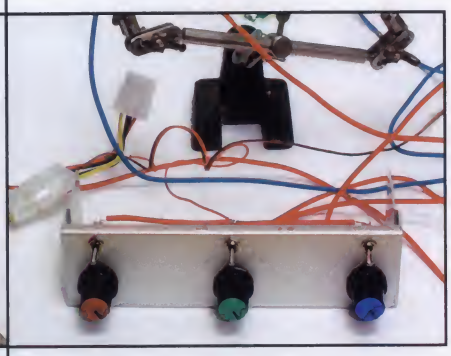


ABOVE: The back of the control panel, after all of the wires have been soldered but before the shiny connections get painted with 'liquid electrical tape' (available from various places, and very handy; Jaycar has it under catalogue numbers NM2832 and NM2834, for black and red respectively).

ABOVE: One watt low value resistors are fine for in-line use with Luxeon Stars running from five volts. If you're using more Stars in a single array, or running them from 12 volts, then you'll need higher power resistors, or a lumpy cluster of one watt units.



ABOVE: Heatsunk caselight, baby. Awww, yeah.



If you want to run Luxeon Stars at or above their one watt maximum rated power, you'll need to give them a bit of cooling. Thermal-epoxy them to your case metalwork and they should be happy; if there's no metalwork available, consider separate heat sinks.

The circuit is simple enough. Five volts from the PSU – the thin red wire – goes to the top terminal of each switch. The middle terminal of each switch is connected via the limiting resistor(s) to the most clockwise terminal of each pot, as you look at them from underneath. The middle terminal of each pot is connected to the positive wire going to the relevant LED(s). The negative wires from the LEDs join together and connect to a PSU ground wire. That's it.

The limiting resistors are 6.8 ohm one watters for the blue and green LEDs, and a pair of 8.2 ohm one watt units in parallel for the two parallel red-orange Stars. These values, plus the roughly one ohm minimum resistance of the pots, and the extra fragment of an ohm from the rest of the circuit, keep the Stars a bit below their maximum rated power.

The whole rig consumes only about 900mA from a five volt supply, with everything at full power. Run each colour separately at full power and the green and blue LEDs consume about 260mA each; the two reds consume 500mA between them. At this level, the LEDs will be happy with unremarkable cooling. ○

BELOW: I installed the pots and switches on a 5.25 inch bay cover for my Lian Li PC-60 case. These Aluminium bay covers are easy to hack on, and plastic covers are even easier. Where and how you install a mod like this is entirely your business.

BOOTY TIME

Xoxide CPU Tacho

Digital LCD panels on you box are so old school. Thankfully science has come to the rescue, as it always does. The future is here now, and it is analog. From Xoxide comes the CPU Tacho. It shows the CPU load, but its real purpose is to add a cool factor of approximately 1 zillion to your box. It's reviewed on page 54 of this very issue. This is quite clearly the coolest thing ever, of the month, and adds a bit of ricer spice.

Q: How many times has Evel Knievel broken bones?

Spider-Man and Punisher grills

PC Case Gear (03 9568 0932) stocks cool stuff. Stuff like the Spider-Man fan grill. It's a crazy world we live in where these things are conceived and manufactured. But crazy equals cool in our book. The grills are 80mm and are useful for preventing fingers being hurt if they're stuck into a spinning fan. Come to think of it, a Batman grill with a light behind it would be cool, then, with the room lights out it would project the Bat signal on your wall. There's one of each of these fan grills to win.

Q: What font is used in most comic strips?

Neverwinter Nights plus exclusive jacket worth $300.

The people at Gamenation are very nice. We asked for a few copies of Neverwinter Nights to give away, and they chucked in a stylie NWN jacket as a special first prize. Bloody legends. There are five copies of the game to win. With the El Grande winner being able to wear their NWN jacket while they play the game. Geeky? Yes. Desirable? Most certainly!

Q: What monster has the most hit dice in Dungeon and Dragons?

Lian Li mouse pads

The world is a crazy place. The case modding scene is a crazy example of craziness. Lian Li is responsible for inspiring some crazy shit. And now, the impossible has happened. Never in our wildest imaginations would we have expected Lian Li to release an Aluminum mouse pad. Crazy huh? Damn cool, actually. Plonk one of these down at your next LAN and watch the envy! Watch closely, because the second you look away it'll probably get nicked. We've got 15 to give away thanks to Lian Li in Taiwan! Sweet.

Q: Which mouse fought at the Great Battle of Beruna?

Atomic 17 winners: Dungeon Siege: Q. What is a Grue? A. A Grue is a sinister predator, dwelling in the darkest places of the earth. They are deathly afraid of light, with even the feeblest torch scaring them away. They're also a prominent feature of the games Zork and Zork II, encouraging adventurers to stock up on torches and lanterns to avoid being eaten by a Grue. W.Hillsley, Avoca QLD; MacCombie, Mornington VIC; M. Furmage, Tas; E McKenzie, Wheelers Hill VIC; M. Villano, Cumberland Park SA; B. Turner-Jones, Strathfieldsaye Vic; R. Howard, NZ; A. Kovacevic, Langwarrin VIC; K. Fong, Kardinya WA; W. Gardiner, East Brisbane QLD. Global Operations: Q. Who was impersonated, and did the impersonating, during the spectacular hostage rescue at Entebbe? A. Senior Ugandan officers and Idi Amin were impersonated by Lieutenant Colonel Jonathan Netanyahu and his IDF troops driving a black Mercedes-Benz and two Landrovers. P. Gallagher, Enfield NSW; D. King, Balmain NSW; A Michaelson, Proserpine QLD; K Chang, Belmont WA. HOMM IV and M&M IX: Q. Who was Smeagol's companion? A. Deagol. Ryan McLoughlin, Ferntree Gully VIC; D. Tan, Carlingford NSW; A. Soundy, Wanganui NZ; L. Noske, Ferntree Gully VIC; B. Tan, Brighton VIC. Serious Sam SE: Q. What ancient structure was carefully raised to higher ground prior to the damming of the Nile? A. Abu Simbel. M Waters, Atherton QLD; C. Newell, Woy Woy NSW; M. Furmage, TAS; M. Walker, Prospect SA; Jackie, email.

Email entries to win@atomicmpc.com.au or post them to: Atomic, [Competition Name], PO Box 275, Beaconsfield NSW 2014. Please send a separate entry for each competition. The closing date for entries is 21 August 2002. Winners will be announced in Atomic 21.

Terms and Conditions of Entry. 1. The promoter is AJB Publishing Pty Ltd (ACN 083 063 914) of Unit 2-5/44-70 Rosehill Street, Redfern NSW 2016. Promotion period is from 9.00am on 18.07.02 until 12.00pm on 21.08.02. 2. Entry is open to residents of Australia and New Zealand. Management and employees of AJB Publishing Pty Ltd and their immediate families, and any advertising, marketing or promotional firms associated with this promotion are not eligible to enter. 3. Enter by posting or emailing forms to AJB Publishing Pty Ltd. 4. The draw will be held at the offices of AJB Publishing Pty Ltd at 5.00pm on 21.08.02. Winners will be notified by mail and published in Atomic 21. The prizes are not transferable or exchangeable. 6. The judges' decision is final and no correspondence will be entered into. 7. The promoter reserves the right to publish the winner's name and suburb for promotional purposes. 8. All entries will become the property of AJB Publishing Pty Ltd.

NEW LOOK

2CDs TURBOCAD V7.1 • NET SPECIAL • LINUX TOOLKIT • GAMES • DRIVER UPDATES

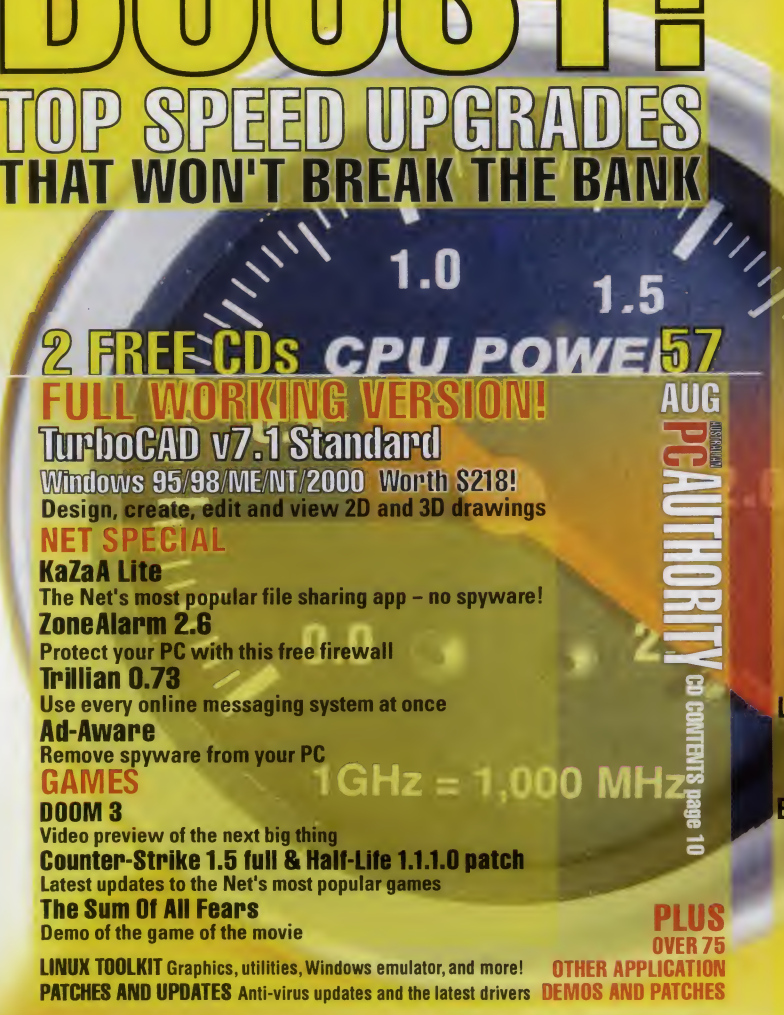
AUSTRALIAN PC AUTHORITY

MAKING TECHNOLOGY WORK FOR YOU

AUGUST 2002 | ISSUE 57 | $7.50

BOOST!

TOP SPEED UPGRADES THAT WON'T BREAK THE BANK



FULL WORKING VERSION!

TurboCAD v7.1 Standard

Windows 95/98/ME/NT/2000 Worth $218!

Design, create, edit and view 2D and 3D drawings

NET SPECIAL

KaZaA Lite
The Net's most popular file sharing app – no spyware!

ZoneAlarm 2.6
Protect your PC with this free firewall

Trillian 0.73
Use every online messaging system at once

Ad-Aware
Remove spyware from your PC

GAMES

DOOM 3
Video preview of the next big thing

Counter-Strike 1.5 full & Half-Life 1.1.1.0 patch
Latest updates to the Net's most popular games

The Sum Of All Fears
Demo of the game of the movie

LINUX TOOLKIT Graphics, utilities, Windows emulator, and more!

PATCHES AND UPDATES Anti-virus updates and the latest drivers

AUG AUSTRALIAN PC AUTHORITY CD CONTENTS page 10

PLUS OVER 75 OTHER APPLICATION DEMOS AND PATCHES

MOTHERBOARD MEGATEST p80
18 boards in the Labs, we find the best for you

CHEAP 3D p44
SiS Xabre – the GeForce killer for half the price

FREE SPEED p156
Tweak your BIOS for more performance

WHICH CPU? p36
Fastest Athlon XP and Pentium 4 head to head

DIY WEBSITE p153
Save money and do it yourself First in a three-part guide

LEARN HACKER SPEAK p159
Understand the jargon of the Internet underground

BRAINS VS. COMPUTERS p108
How does your brain compare?

LINUX TOOLS AND TRICKS p131
Red Hat 7.3 performance, security and application tips and tweaks

BEST MUSIC MAKING TOOLS p65
Hit the right note – right now

$AU7.50 Inc. GST $NZ8.95 Inc. GST
ISSN 1329-2978
08
9 771329 297006

TECH SUPPORT • LINUX • ADVANCED WINDOWS • GRAPHICS • HOW TO

ON SALE NOW

Let's talk about you, baby

A picture may say a thousand words, but a thousand words can paint a hell of a picture. There's more than a thousand words on these two pages, picture that! The LOTM and POTM this month score a copy of Warcraft III, thanks to Vivendi. Nice.

LOTM: The static myth

Ever since they started appearing at Dick Smith Shops, everyone who isn't a Certified Engineer has jeered: 'You CAN'T open the (PC) box WITHOUT an antistatic WristStrap ™!'

To set the record straight on the WristStrap once and for all:
1) A WristStrap attaches you to the case, or any other GROUNDED bits you find metallically attached to the ground.
2) If the case IS plugged in (and that plug is off) then you and the case are one, ie. GROUNDED!
3) If it ain't off (wall plug) it could give you a tickle if you touch some fiddly bits, and a bolt if you touch anything resembling a display card, TV device, or nosey into the power supply (without contacting any EARTH).

Now if you're attached to EARTH, then instead you'll temporarily knock out the power supply, or your home fuses.
'Ta Ken'

POTM: [AESB]

www.atomicmpc.com.au/forum.asp?cat=ge&fid=22063

Although meatbites started this thread way back in December last year, he updates it almost daily, so using that shaky technicality, we're giving it to meatbites this month. [AESB] is an amazing bit of work from meatbites – and really, the entire Atomic community. He's brought the entire Atomic community together, literally, and given us all a window into what sort of people Atomicans are. Bloody good effort meat!

Hitting Moore's Wall

While reading Tim Dean's article on hitting Moore's Wall, and his review on future processing technologies, I noticed one technology he neglected: Asynchronous Processing.

Most of the problems that Tim talks about are related to having to produce smaller and smaller components in the CPU in order to obtain faster clock speed without creating another Chernobyl. As any overclocker worth his salt knows, more Clock Speed = more Heat. However, this need for ultra miniaturisation only becomes necessary when you are tied to synchronous computing, that is, execution of instructions based on a clock. This was done by the 'processor pioneers' who decided that there was no other way at the time to regulate all of the components in a microprocessor other than using a clock. This has worked fine until now, and as we know, has even become the basis for measuring processor speed. As we also know, this is not a good method for measuring speed (just ask AMD!), because the clock speed does not relate to the amount of work that is done per cycle, or 'tick' of the clock.

Okay, so we went with synchronous processors. What was the alternative? Asynchronous processors don't need a clock in order to regulate operation. They can exchange data independently, and they run at the average speed of all of the components. What are the advantages? They are faster and they use electricity far more efficiently meaning longer life. These processors have been around in the background for quite a while, and have been researched by the big guns: IBM, Sun Microsystems and even Intel! In fact, at the time of the release of the Pentium 130-150MHz CPUs, Intel developed an asynchronous P150 equivalent. It never took off, because at the time, there was no end in sight for synchronous processors (The IT world is notoriously short sighted, look at the Y2K example), and all the infrastructure was set up to build them. It would have been too expensive to produce asynchronous processors at the same time, or synchronously as it were. These reasons for not producing asynchronous processors are still valid today, with the added problem of there being no engineers trained in asynchronous to design them!

Although they are few and far between at the moment, when we do hit Moore's Wall, this is more likely to be the next technology powering our PCs. I guess that will put an end to conventional overclocking too. . .
Andrew Woodward

Tim Dean replies:
You make an interesting point about asynchronous processing, although ultimately we will still be confronted with Moore's Wall whichever way we go – even asynchronous processors need transistors. . . Asynchronous processors are also not without their own problems. They are a bugger to interface with other clocked components, they need a really fast and efficient handshaking protocol that is difficult to implement, they require abandoning a lot of conventional processor technologies that have been made very efficient over the years. They also need a big shift in the very low level design in terms of the way logic is implemented and ultimately, their complexity can work against them in the end. It's one of those steam power/internal combustion engine things – if we had spent the time developing steam technology as we had developing the internal combustion engine, steam could well be better, but at the time, the ICE was the easiest, most efficient and cheapest way forward – and at the end of the day, it's hydrogen that will probably win in the future anyway.

Atomic laser aims at Moore

I have just finished Tim Dean's article on Moore's Law/Wall which I found interesting. The article sparked my memory banks to life and brought to

mind an article I read some five odd years back about some propeller-head somewhere experimenting in etching microchips with an atomic laser. I'm referring to the tiny little things that fascinated Rutherford, Oppenheim et al, not the mag we pore over every month.

Given that a beam the width of a single atom is smaller than a laser beam, if this technology is feasible and practical the benefits in miniaturisation are enormous (no pun intended), but will it have any direct effect on speed?

I wonder if anyone out there is able to share any technical opinions on this?
Phillip Linder

What's next?

I thought Tim's article on lighting and shadows – what needs to be done to bring us closer to photorealistic games – was excellent.

John Carmack tells us he is spending most of his time and effort on lighting and shadow in Doom 3's graphics engine, which ties up well with Tim's views too. *Atomic* John's id and ergo article was great too, and the Heavy Water project is also advancing well.

I ponder what major joys the next six months will bring us. . .?

My guess is that CPU-wise everyone will be waiting until year end for the Hammer series, and no world shattering things will happen in the CPU market until then.

I hope Hammer isn't a tad disappointing at first – I hear rumours that AMD has some serious tweaking still to do – with just enough time left.

I expect faster DDR RAM and supporting chipset to become more common, and maybe motherboards move to commonly having AGP 8x, USB 2.0 and LAN as standard connectors with no serial or parallel ports like the ABIT IT7 pictured on *page 67* last issue. I wonder how soon (if ever) they will drop support for a floppy drive?

But the big news next quarter and beyond I expect will be the release of three, to all four, of the big guns in the next generation of video cards, their programming toolsets and DirectX 9. And then we will want to see how Doom 3 and next generation games run on them – and guess what will be next?

I think NVIDIA might be right when its Marketing Department says the combo of NV30 + DirectX 9 + Cg (version for DirectX 9) + Detonator 5 series will be the very dawn of the next big step forward in performance and effectiveness of 3D graphics.

Mind you the start of the next great thing means you are busily awaiting all the software developers to decide to jump on that wave – so add six months minimum until software is ready for it.

I still feel that in the CPU department, with the head room our PCs have today, the hardware bottleneck is all constrained by speed and ease of use of the video card and its feeding data source – the AGP bus's bandwidth. Whether I have a 1, 2, 3, or 4GHz CPU (or two) matters far less to me than speed and power of the video card and the AGP bus (presuming there is some decent software out there to use all this grunt).

Well I've reached the end of this rant. I am dead certain there will be plenty for *Atomic* and its readers to dwell on, discuss, analyse, gloat on and enviously die to own in the coming months – keep well and have fun.
Matthew (g__day)

More super cool cooling

Just a comment on the super cool cooling response. The Cray 1 and Cray X-MP systems were actually cooled by Freon, but it wasn't used to cool the components directly.

Each circuit board was mounted on copper plates that moved the heat away from the electrical components.

These modules were then mounted horizontally and stacked into six-foot-high towers that contained two cold bars per tower, which came into contact of the two longer edges of each module. The Freon flowed from top to bottom in these cold bars. A refrigerant system contained in the base cooled the Freon.

The use of Fluorinert was introduced with the Cray-2 and Cray Y-MP models. The Y-MP had circuit boards mounted onto a cold plate that the Fluorinert flowed through. Water cooled heat exchangers refrigerated the Fluorinert. This cooling technique was also used by the Cray C90, T3D and T3E systems.

The Cray 2 (and later the T90) actually had all the modules and power supplies immersed in a tub where the Fluorinert actually flowed around in. The ultimate in liquid cooling ;-)

The next generation Cray, the SV2, will mount each module upside down, with each processor having a spray cap mounted over it, which will allow the Fluorinert to be sprayed directly on to the processor assembly. The warm Fluorinert is then recovered and passed through a heat exchanger.

There are two further drawbacks with Fluorinert (the version Cray uses anyway). The first is the weight of the liquid. It is about twice as heavy as water, meaning you need a better quality pump to push the Fluorinert around any cooling block for a PC. Also, if Fluorinert decomposes due to an electrical arc, it is quite toxic. There are special sensors built into some of the Cray systems such as the T90 to detect this, so as Cray engineers don't expose themselves should this occur.
Wayne aka popcnt

House modding

I wanted to congratulate you on your article about cabling up your house for LAN data. We recently did this at my place, and having a permanent network for things like Internet connection sharing and games is pretty cool. It was fun to do too, apart from monkeying around in the roof which was a real drag (I still have skinned knees and bumps on my head).

Based on these experiences I was wondering if I could offer your readers a few extra tips that we found handy during the process.

Firstly, You can often be efficient and combine television antenna or telephone socket points with your RJ-45 socket. Both Clipsal and HPM make standardised sockets and wall plates, so you just buy a dual-socket plate, stick an RJ-45 in one and your antenna or RJ-15 telephone socket in the other. You can save a bit of time and money that way, as you can then use the old single-socket that housed the antenna as a LAN socket somewhere else, and you don't have to cut as many holes in the wall. If your telephone socket is one of the old-style ones you can just rewire it to a new RJ-15! (I don't know if you need to be licensed to work on these cables, but the voltages are easily within safe levels).

Secondly, if you're having trouble getting the cable down to one of these access points, you can disconnect the antenna or phone cable, tie it to a rope, pull it back to the source and tie it to your Cat5 and then use the rope to pull them both back down. As long as you're feeding Cat5 in from the same place as the other cable is coming in from (say under the house, or in the roof) it's heaps easier than feeding the cable through by other means.

Anyway, hope those are helpful to some people and good luck to anyone who tries it.
John Yasmineh

LARGEST SELECTION OF GAMES ONLINE AT GREAT PRICES

GAMES MARKET .com.au

SHOP 1, 54 MILLER STREET
NORTH SYDNEY, NSW 2060
TELEPHONE: (02) 9554 0013
WWW.GAMESMARKET.COM.AU
INFO@GAMESMARKET.COM.AU

FOR TRADE ENQUIRIES :

Software 4 You

6 / 385-389 PACIFIC HIGHWAY
CROWS NEST NSW 2065
TELEPHONE: (02) 9929 3933
FAX: (02)9929 3533

Have you done your "CASE" study?

We are talking about Aluminium Cases!

You may have the latest and fastest CPU and VGA card. Do you have the best case to house all the greatest components? Aluminium cases dissipate heat 3 times faster than traditional steel cases and when it's made by lian Li, your PC experience is guaranteed luxurious. Here are some comments:

apc *Australian Personal Computer*

"Lian Li cases are legendary among PC enthusiasts and case-modders, and are generally considered to be the Rolls Royce of aftermarket PC cases. Not only because they are comparatively expensive, but because their features and attention to detail warrant the price."

PC PowerPlay

"A stunner. All aluminium and built to withstand a direct nuclear strike in the megaton range. As we have mentioned more than once, we even dropped this case down a flight of concrete steps and it barely flinched. Ten bays keep everything snug, three extra fans keep it cool, and slide-off covers and a motherboard tray mean it's ready for upgrade action any time".

atomic

"Undoubtedly the parent of the Aluminium case craze, Lian Li has been incredibly successful in changing the case buying mindset."

See detailed reviews (search "Lian Li") at
www.dansdata.com
www.overclockers.com.au
www.gamingin3d.com

All cases come without power supplies

Aluminium Tower Cases

PC-60USB
Silver full aluminium anodised
$390 RRP

PC-65USB
With transparent side panel
$475 RRP

PC-12B
Powder coated external with full aluminium inside
$320 RRP

Common features
- Sliding tray for motherboard
- 2 front ball bearing fans with filter
- 1 rear ball bearing fan
- Selectable fan speed control
- Thumbscrews
- 490x210x450mm
  12 total bay 4x 5.25", 3x3.5", 5x3.5 Hidden

PC-70
Silver full aluminium anodised $539 RRP

PC-71
Black full aluminium anodised $559 RRP

- 2 front ball bearing fans with filter
- 2 rear ball bearing fans
- Selectable fan speed control
- Thumbscrews
- 210X595X588mm. Suitable for dual CPU M/B.
- 15 total bay

PC-5 Economic
Beige Colour powder coated
$199 RRP

PC-6 Economic
Silver colour powder coated
$199 RRP

- 2 front fans with filter
- 1 rear fan
- Selectable fan speed control
- Thumbscrews
- 490x210x450mm
- 12 total bay 4x 5.25", 3x3.5", 5x3.5 Hidden

Aluminium Server Cases

PC-72SCA
Silver full aluminium anodised
- SCA-2 hot swap bays supports SCSI Ultra160
- SCA-2 backplane module
- 2x16cm ball bearing fans
- Selectable fan speed control
- Thumbscrews
- 589x209x574mm
- 13 total bays

$790 RRP

PC-626
Silver full aluminium anodised
270x665x498mm
- 14 total device bays 4x5.25,3x3.5, 8x3.5 hidden for HDD
- 4 x 12cm two ball-bearing Suitable for dual CPU M/B
- On SCA version: SCA-2 Hot Swap bays, Support Ultra 160, SCA-2 backplane module

$1190 RRP, SCA $1390 RRP

PC-76
Silver full aluminium anodised
- 20 total bays 6x5.25,2x3.5, 12x3.5 hidden
- 6 ball-bearing cooling fans
- 265x559x630mm
- Suitable for dual CPU M/B

$990 RRP

PC-78
Silver full aluminium anodised
- 20 total device bays 6x5.25,2x3.5,12x3.5 hidden for HDD
- 4 x 8cm two ball-bearing fans 2 x 12cm two ball-bearing fans
- Suitable for dual CPU M/B (Max size: 12 x13)

$1650 RRP

Case Accessories

PANEL-65
Silver colour aluminium
Transparent side panel to suit PC-60USB $85 RRP

PANEL-75
Silver colour aluminium
Transparent side panel to suit PC-70USB $115 RRP

FE-525
Silver Aluminium Front Easy Access all PC ports at the front of the PC $90 RRP

T-4 /T-4B
Dual thermometer
Silver/Black Monitor
CPU/MB/HDD temp
$59 RRP

MF-30HDD
Expansion mounting kit
Add 3 more HDD space to PC cases $19 RRP

F-7 /C-2 /C-4/C-6
Aluminium bezels for FDD and popular CDROMs
CDROM/DVD models: Sony-CDU-5211, Pioneer DVD-116, TEAC-CD-540E
From $9.90 RRP

EX-12S
SCA-2 Module
SCA-2 Ultra-160 Hot swap module. Takes 2x 5.25" bay space $270 RRP

LIAN LI RESELLERS

NSW		
AusPCMarket	www.auspcmarket.com.au	
ECOM Computers	Sydney City	02-9299 0022
BBOS Computers	Sydney City	02-9211 2919
Computer Interchange	Chatswood	02-9411 4144
Computer Interchange	Hornsby	02-9476 0833
Microtech Corporation	Auburn	02-9648 1818
Plug & Play Computers	Sylvania	02-9544 6911
VIC		
Digiworld	Melbourne	03-9663 6699
Scorpion Technology	Burwood East	03-9886 1615
PC Case Gear	www.pccasegear.com.au	
Computers & Parts Land	Notting Hill	03-9548 7088
QLD		
Quality & Innovation	Brisbane City	07-3220 2500
Karana Computers	Chuwar	07-3812 5211
Tropical Wings Computer	North Cairns	07-4031 6883
TNQ	Mossman	07-4098 3888
ACT		
Cougar Computers	Mitchell	02-6242 2777
Technology Warehouse	Mitchell	02-6242 3966
WA		
Austin Computers	Osborne Park	08-9201 2788
PLE Computers	Wangara	08-9309-4771
Navada Computers	Osborne Park	08 9446 4099
Computer Cash & Carry	Leederville	08-9388-1202
SA		
Duncan Computers	Adelaide	08-8212 6600
Cherry Computers	Adelaide	08-8232 5700
Adrenalin Computers	Adelaide	08-8410 0777
NT		
Tec Chips	Coconut Grove	08-8948 3663

Anyware™ COMPUTER ACCESSORIES

Australian Importers & Wholesalers www.anyware.com.au

SYDNEY TEL: 02-9879 5788 FAX: 02-9879 5388

MELBOURNE TEL: 03-9763 8200 FAX: 03-9763 8400

PERTH TEL: 08-9242 8588 FAX: 08-9242 8688

C.W. Supplies

www.cws.net.au

Phone : (03) 5945 2000 Email : sales@cws.net.au
Fax : (03) 5945 2001 Web : http://www.cws.net.au
PO Box 285 Pakenham VIC 3810.

All prices include GST Dealer enquiries welcome
Goods sent C.O.D or overnight with Credit card or Direct deposit.

CPU'S Inc. Fan/Heatsink

INTEL	
Celeron 1.1GHz Socket 370 Boxed	$152.00
Celeron 1.2GHz Socket 370 Boxed	$155.00
Celeron 1.3GHz Socket 370 Boxed	$165.00
Celeron 1.7GHz Socket 478 Boxed	$204.00
Pentium4 1.7GHz Socket 478 Boxed	$319.00
Pentium4 1.8A GHz Socket 478 Boxed	$381.00
Pentium4 1.9GHz Socket 478 Boxed	$403.00
Pentium4 2.0A GHz Socket 478 Boxed	$440.00
Pentium4 2.2A GHz Socket 478 Boxed	$536.00
Pentium4 2.4A GHz Socket 478 Boxed	$899.00
AMD	
Duron 1200MHz Socket A Boxed	$129.00
Duron 1300MHz Socket A Boxed	$149.00
Athlon XP 1800 Socket A Boxed	$239.00
Athlon XP 1900 Socket A Boxed	$296.00
Athlon XP 2000 Socket A Boxed	$355.00
Athlon XP 2100 Socket A Boxed	$430.00
VIA	
C3 800MHz Socket 370 Boxed	$109.00

CD, CD-R/W, DVD' S

LITEON	
seen issue 16 40x 32x 12x CD-R/W Kit	$129.00
48x 40x 12x CD-R/W Kit	$149.00
48x 48x 12x CD-R/W Kit	$210.00
52x CD Rom	$55.00
seen issue 18 40x 24x 10x CD-R/W EXT. USB2.0	$310.00
16x DVD Kit Includes Power DVD	$82.00
LG	
40x 32x 10x CD-R/W Kit	$139.00
32x 12x 8x 8x CD-R/W DVD Kit	$173.00
SONY	
52x CD Rom	$66.00
40x 24x 10x CD-R/W Kit	$159.00
48x 40x 12x CD-R/W Kit	$220.00
24x 20x 8x 8x CD-R/W DVD PCMCIA	$699.00
16x DVD Drive	$103.00

CASES

DESKTOP	
ATX STARCASE 300W	$68.00
MID TOWER	
ATX STARCASE 300W	$69.00
ATX STARCASE USB to Front 300W	$79.00
ATX CWS DELUXE USB to Front 300W	$95.00
ATX AURIGA 300W	$99.00
ATX CLICK21 300W	$124.00
FULL TOWER	
ATX STARCASE 300W	$93.00
ATX INWIN 300W	$202.00
ATX INWIN DUAL 300W	$411.00
ATX Aluminium Server 300W	$329.00

MODEMS

DYNALINK	
56K V90 ISA Internal	$88.00
56K V90 External	$89.00
56K V90 External USB	$119.00
ADSL External USB	$370.00
ADSL Internal PCI	$242.00
D-LINK	
56K V92 Upgradeable PCI	$45.00
NETCOMM	
56K V90 External Mega-I-Modem	$97.00
3COM	
56K V90 External Message Modem	$204.00
MITSUBISHI	
56K V90 External	$97.00
56K V90 PCMCIA Modem/network	$225.00

MEMORY

SDRAM	
64 MB PC-133	$43.00
128 MB PC-100	$53.00
128 MB PC-133	$49.00
256 MB PC-100	$96.00
256 MB PC-133	$93.00
512 MB PC-133	$179.00
RDRAM	
128 MB 800MHz	$105.00
256 MB 800MHz	$199.00
DDR	
256 MB PC-2100	$82.00
256 MB PC-2700	$129.00
512 MB PC-2100	$193.00
512 MB PC-2700	$254.00

MOTHERBOARDS

INTEL	
850MD ATX RDRAM Socket 478	$279.00
845PT ATX DDR Socket 478	$231.00
845EPT-2 ATX DDR Socket478 533	$246.00
845EBG2 ATX DDR Socket478 533	$249.00
845EBGL2 ATX DDR Socket478 533	$259.00
GIGABYTE	
GA-6VTXE-A ATX Socket 370U	$140.00
GA-7DX+ ATX DDR Socket A	$122.00
GA-7VTXE+ ATX DDR Socket A	$159.00
GA-7VRX ATX DDR Socket A	$185.00
GA-7VRXP ATX DDR Socket A	$247.00
GA-8IRXP ATX DDR Socket 478	$265.00
GA-8IRM ATX DDR Socket 478	$169.00
GA-8IDML-C ATX SDRAM Socket 478	$173.00
GA-8SDX ATX SDRAM Socket 478	$129.00
GA-8IE ATX DDR Socket 478 533MHz	$219.00
GA-8IEXP DDR Socket 478 533MHz	$333.00
MSI	
KT3 ULTRA ATX DDR Socket A	$224.00
KT3 ULTRA-ARU ATX DDR Socket A	$279.00
6528-LE ATX Socket 478	$229.00
6398 Ultra ATX DDR/Raid Socket 478	$305.00
6566 ATX DDR Socket 478	$235.00
6309 PRO ATX Socket FC-PGA	$152.00
6547 ATX DDR Socket 478	$158.00
6378 ATX SDRAM Socket A Vid/S/LAN	$149.00
ABIT	
BL7 ATX SDRAM Socket 478	$189.00
KG7 ATX DDR Socket A	$163.00
KR7A ATX DDR/Raid Socket A	$333.00
NV7M ATX DDR Socket A	$221.00
SOLTEK	
SL-65KV2-T ATX Socket FC-PGA	$143.00
SL-75DRV-5 ATX DDR Socket A	$193.00
EPOX	
8KTA3L+ ATX SDRAM Socket A	$135.00
8KHAL ATX DDR Socket A	$149.00
8K3A ATX DDR Socket A	$199.00
8K3A+ ATX DDR Socket A	$223.00
VIA	
P4XB-S ATX DDR Socket 478	$131.00
P4XB-S ATX DDR Socket 478	$131.00
LITEON	
NA380 ATX DDR Socket 478 533MHz	$142.00

MONITORS

HYUNDAI	
15" Hyundai V560 Monitor	$219.00
17" Hyundai V770 Monitor	$279.00
17" Hyundai F770 Flat Screen Monitor	$316.00
19" Hyundai P910+ Monitor	$445.00
21" Hyundai G210 Monitor	$1213.00
15" Hyundai L50A LCD Monitor	$793.00
15" Hyundai LM1510A LCD Monitor	$854.00
17" Hyundai L70A LCD Monitor	$1556.00
18" Hyundai L80A LCD Monitor	$2099.00
PHILIPS	
15" Philips 105E Monitor	$220.00
17" Philips 107E Monitor	$299.00
17" Philips 107T Monitor	$381.00
17" Philips 107P Monitor	$618.00
19" Philips 109P Monitor	$879.00
21" Philips 201B Monitor	$1672.00
15" Philips 150P2D Black LCD Monitor	$1108.00
15" Philips 150P2E LCD Monitor	$1189.00
18" Philips 180P LCD Monitor	$2839.00
LG	
17" LG SW700S Monitor	$289.00
17" LG Flatron 775FT Monitor	$419.00
15" LG LB1510S Silver LCD Monitor	$818.00
HERCULES	
15" Prophetview720 LCD Monitor	$899.00
17" Prophetview920 LCD Monitor	$1573.00
MITSUBISHI	
15" 1554R Monitor	$242.00
17" 1770H Monitor	$297.00
17" DV1786 Monitor	$378.00
19" DV1998 Monitor	$499.00
21" DV2115E Monitor	$1350.00
SONY	
17" CPD-E230 Trinitron Monitor	$567.00
19" CPD-G420 Trinitron Monitor	$1122.00
21" CPD-G520 Trinitron Monitor	$1829.00

SOUND CARDS

PINE	
PCI Stereo	$23.00
CREATIVE	
Vibra 128	$45.00
Sound Blaster Live OEM	$72.00
Sound Blaster Live DE	$85.00
Sound Blaster Audigy SE	$159.00
Sound Blaster Audigy Platinum	$421.00
Sound Blaster Audigy Platinum EX	$483.00
Sound Blaster Extigy	$341.00
S/Blaster Live & Inspire5300 Cornbo	$329.00

GRAPHIC CARDS

LEADTEK	
64 MB TNT-2 M-64 AGP	$75.00
64 MB Geforce MX-400 AGP	$129.00
64 MB Geforce MX-400 AGP TV-Out	$139.00
64 MB Geforce4 MX440 A170 AGP	$205.00
64 MB Geforce4 MX460 A170 PRO TD	$319.00
64 MB Geforce4 4200TD A250LE	$419.00
62 MB Geforce4 4200TD A250 TV-IN	$426.00
128 MB Geforce4 4400 TD A250 TV-IN	$545.00
128 MB Geforce4 4600 TD AGP	$737.00
ABIT	
64 MB Geforce MX-400 AGP TV-Out	$125.00
64 MB Geforce4 MX440 AGP TV-Out	$199.00
128 MB Geforce 4400 TV-Out	$527.00
MSI	
64 MB Geforce MX-400 AGP TV-Out	$143.00
64 MB Geforce4 MX 8866 AGP	$227.00
64 MB Geforce4 MX 8867 TV-In AGP	$308.00
128 MB Geforce4 4400 8871 AGP	$582.00
128 MB Geforce4 4600 8872 AGP	$822.00
ASUS	
128 MB Geforce4 8440 AGP	$699.00
128 MB Geforce4 8460 AGP	$916.00
GIGABYTE	
32 MB Rage 128 PRO AGP	$75.00
64 MB Radeon 7500 AGP TV-Out	$169.00
64 MB Radeon 8500 AGP	$354.00
128 MB Radeon 8500 PRO AGP	$499.00
JATON	
64 MB Geforce2 MX-400 AGP	$115.00
64 MB Geforce4 MX 420 AGP TV-Out	$139.00
64 MB Geforce4 MX 440 AGP TV-Out	$189.00
64 MB Geforce4 MX 440 Dual Head	$199.00

HARD DRIVES

MAXTOR	
20.4 GB 5400rpm	$135.00
40.0 GB Viper 7200rpm ATA 133	$159.00
60.0 GB 5400rpm	$179.00
60.0 GB Viper 7200rpm ATA133	$195.00
80.0 GB Viper 7200rpm ATA133	$227.00
160.0 GB ATA133 5400rpm	$529.00
80.0 GB External Firewire Drive	$719.00
SEAGATE	
40.0 GB U6 5400rpm	$145.00
40.0 GB Barracuda IV 7200rpm	$159.00
60.0 GB Barracuda IV 7200rpm	$195.00
80.0 GB Barracuda IV 7200rpm	$227.00
WESTERN DIGITAL	
40.0 GB 7200rpm ATA5	$162.00
60.0 GB 7200rpm ATA5	$209.00
80.0 GB 7200rpm ATA5	$235.00
100.0 GB 7200rpm ATA5	$379.00
120.0 GB 7200rpm ATA5 8MB	$447.00
IBM	
40.0 GB GXP60 7200rpm	$177.00
60.0 GB Deskstar 7200rpm	$199.00
80.0 GB Deskstar 7200rpm	$243.00
120.0 GB Deskstar 7200rpm	$442.00

PRINTERS

CANON	
S100 SP Bubble Jet	$139.00
S200 SP Bubble Jet	$169.00
S300 Bubble Jet	$232.00
S520 Bubble Jet	$353.00
S750 Bubble Jet	$485.00
S820 Bubble Jet	$574.00
S820 D Bubble Jet	$794.00
S900 Bubble Jet	$794.00
S4500 Bubble Jet	$600.00
S6300 Bubble Jet	$794.00
S9000 Bubble Jet	$1058.00
LBP 810 Laser	$505.00
LBP-1000 Laser	$899.00
HP	
656C Deskjet	$119.00
845C Deskjet	$174.00
948C Deskjet	$266.00
960C Deskjet	$439.00
990CXI Deskjet	$580.00
1125C Deskjet	$544.00
1000 Laserjet	$607.00
1200 Laserjet	$781.00
1200N Laserjet	$1304.00
2200D Laserjet	$1537.00
EPSON	
C20UX Stylus	$106.00
C40UX Stylus	$162.00
C40SX Stylus	$162.00
C60 Stylus	$239.00
C70 Stylus	$402.00
C80 Stylus	$506.00
810 Photo Stylus	$347.00
890 Photo Stylus	$589.00
1290 Photo Stylus	$964.00
EPL-5700 Laser	$493.00
EPL-5900 Laser	$645.00

FOR UP TO DATE PRICES & A COMPLETE PRODUCT LIST VISIT OUR ONLINE STORE : WWW.CWS.NET.AU

www.scorptec.com.au

scorpion TECHNOLOGY

ONE STOP SHOP FOR YOUR COMPUTER NEEDS

Established since 1998

WE DELIVER AUSTRALIA WIDE INCLUDING TASMANIA, CASH/CREDIT CARD/COD/DIRECT DEPOSIT PAYMENT ACCEPTED

MONITORS

17" AOC 7VLR	$260
17" AOC KLR Flat	$300
17" LG 700S	$265
17" LG 775FT FLAT	$360
17" Philips 107E Blackclr	$310
17" Philips 107T Flat	$360
17" Philips 107P Flat	$545
17" Samsung 753DFX	$375
17" Sony E230 Flat	$530
17" Viewmaster 0.27	$260
17" Viewmaster Flat	$320
19" AOC 9GLR	$390
19" AOC 9KLR FLAT	$495
19" Hitachi Cm721 Flat	$695
19" Philips 109B Flat	$695
19" Philips 109P Flat	$835
19" Sony FD G420 Flat	$950
19" Viewmaster 0.26	$399
19" Viewmaster Flat	$495
21" Sony G520 Flat	$1765
21" Philips 201P Flat	$1695

LCD MONITORS

15" AOC LM-500	$720
15" Hercules LCD	$895
15" Hitachi 153XW	$860
15" Hitachi 155XW	$1095
15" LG 1510s	$795
15" Viewmaster	$735
17" Hitachi 171SXW	$1550
17" AOC LM-700	$1295

PRINTERS

Canon BJC1000	$99
Epson Stylus C20UX	$99
Epson Stylus C40UX	$150
Epson Stylus C60	$235
Epson Photo 810	$330
Epson Photo 895	$635
HP Deskjet 640C	$140
HP Laserjet 1200	$765
Xerox P8EX 8ppm Laser	$385

SCANNERS

Acer 3300	$85
Acer 4300	$150
Canon N676U	$175
Canon D660U	$255
HP Scanjet 2200	$149
HP Scanjet 4400	$219
Epson 1250	$199
Epson 1250 Photo	$265
Epson 1650	$325
Epson 1650 SU Photo	$420

SOUNDCARDS

SB Live Value	$55
SB Live DE 5.1 SE	$75
Audigy DE SE	$170
Audigy Platinum	$375
Audigy Platinum EX	$445
Audigy Extigy	$320
Game Sound Muse XL	$50
Fortisimo II	$85
Game Theater XP 6.1	$225
Leadtek Winfast 6X	$75
Philips Accoustic 5.1	$260

SPEAKERS

Altec Lansing AVS500	$145
Altec Lansing 2100	$240
Creative SW320	$85
Creative FPS 1600	$115
Emcom 4.1 speakers	$95
Inspire 2400	$95
Inspire 5100	$210
Inspire 5300	$280
Inspire 5700	$685
Hercules XPS210	$95
Hercules XPS510	$165
Logitech Z560-THX	$399
Milford 240w	$15
Milford 650w	$40
Milford 750w	$50
Tsunami 180w	$15
Tsunami 240w	$30
Yamaha YST-M201	$110
Yamaha TSS-1B	$440
CreativeSurroundstation	$75

CD/DVDROM

Asus 52X/LG52x	$55
Liteon 52x	$50
Sony 52x	$60
LG 16x48 DVD	$95
Liteon 16x48 DVD	$85
Pioneer 16x DVD Tray	$100
Pioneer 16x DVD Slot	$115
Sony 16x40 DVD	$95
Power DVD v3.0	$15

CDRW/DVDRW

Cyberdrive 32x12x48	$120
LG 24x10x40 8mb buf	$115
LG 32x10x40 8mb buf	$135
LG Combo DVD/CDR	$199
Liteon 32x12x40	$115
Liteon 40x12x48	$135
Liteon 48x12x48	$195
MSI 40x12x48	$155
Pioneer DVD/CDRW	$225
Plextor 40x12x40	$390
Ricoh 32x10x40	$155
Pioneer AVR04 DVDR	$895

PROCESSORS

Celeron1000A	$125
Celeron 1.2ghz.	$145
P3-1.26 Tualatin 512k	$475
P3-1.4 Tualatin 512k	$675
Duron 1100	$100
Duron 1200	$115
XP 1800+	$200
XP 1900+	$250
XP 2000+	$310

Retail AMD 3yr wty includes heatsink/fan

Duron 1200	$125
Duron 1300	$150
XP 1800+	$230
XP 1900+	$280
XP 2000+	$335
XP 2100+	$399
Mp2000	$485
Celeron 1.7G (478)	$185
Intel P4 1.6 (256kb)	$280
Intel P4 1.8A	$335
Intel P4 2.0A	$399
Intel P4 2.2A	$499
Intel P4 2.4A	$810
Intel P4 2.26	$510
Intel P4 2.4B	$860

COOLERS

Coolermaster DP56H51	$20
Coolermaster HHC001	$75
Globalwin WBK68-II	$35
Globalwin WBK38-II	$45
Volcano II	$30
Volcano 6CU	$35
Volcano 6CU+	$45
Volcano 7	$50
Volcano 7+	$65
Dragon Orb 3 7000rpm	$55
6cm Case fan	$15
8cm Ballbearing fan	$15
9cm Case fan	$15
Memory Cooling kit	$25
Blue Orb	$27
Orange Orb	$25
Crytal Orb	$35

MEMORY

USB PEN DRIVE 16M	$60
USB PEN DRIVE 32M	$99
USB PEN DRIVE 64M	$170
USB PEN DRIVE 128M	$270
128MB Pc133 SDRAM	$55
256MB Pc133 SDRAM	$95
512MB Pc133 SDRAM	$199
128MB Pc2100 DDR	$55
256MB Pc2100 DDR	$95
Kingmax Pc2100 256mb	$110
Kingmax Pc2700 256mb	$155
Kingston pc2100 256mb	$110
Kingston pc2100 512mb	$250
Kingston pc2700 512mb	$320
Samsung Pc2700 256m	$155
128mb Kingmax Sodim	$110
256mb Kingmax Sodim	$250

HARD DISKS

7200RPM 2mb cache

IBM 20GB	$165
IBM 40GB	$190
IBM 60GB	$215
IBM 80GB	$280
IBM 10gb 2.5"	$195
IBM 20gb 2.5"	$235
Maxtor 40g ATA133	$145
Maxtor 60g ATA133	$180
Maxtor 80g ATA133	$215
Seagate 40gb	$140
Seagate 60gb	$170
Seagate 80gb	$200
Western Digital 40gb	$165
Western Digital 60gb	$200
Western Digital 80gb	$240
Western Digital 100gb	$350
Western Digital 120gb	$380
Special Edition 8mb	
Western Digital 80gb	$280
Western Digital 100gb	$430
Western Digital 120gb 5400RPM	$480
10gb Maxtor	$130
40gb Maxtor	$145

CASES & PSU

Aopen H400	$125
Aopen H600A(300w)	$175
Aopen HQ45P4(250w)	$110
Aopen HQ45P4-PRO	$120
Aopen HQ08P4(300w)	$190
Aopen HQ95P4(250w)	$110
Aopen Qf45(250w)	$110
Aopen Kf45 (250w)	$75
Aopen KF45P4 (250w)	$85
Aopen H340D P4180w	$120
Aopen H450 P4 250w	$120
Auriga Mini Tower 300w	$60
Auriga Midi Tower 300w	$75
Auriga Super Midi 300w	$99
Treetop Aluminium300w	$295
InWin Q500N (300w)	$185
Lian-Li PC 5/6 Midi	$199
Lian-Li Pc12 Black	$275
Lian-Li PC60 USB	$350
Lian-Li Pc65 +Window	$420
Lian-Li Pc70 Full twr	$495
Task 3003 300w P4USB	$120
Topower 320w	$80
Topower 420w	$125
Just Cooler Silent 300w	$100

NETWORKING

Aopen 325 10/100	$25
Intel 8460C 10/100	$80
Surecom 10/100 PCI	$20
Genius 10/100 PCI	$20
Cnet 10/100 PCI	$20
Netgear FA-312	$65
Dlink DFE-530TX	$55
Netgear Rt311 Router	$210
Netgear RP114 Router	$260
Linksys Router + 4 port	$250
Dlink DI-804	$250
Surecom 5port hub	$45
Surecom 8 port hub	$55
Surecom 5port Switch	$79
Surecom 8port Switch	$90
Surecom 10/100 USB	$85
Netgear Ps110 Printsvr	$260
Surecom PCMCIA 10m	$80
Surecom PCMCIA 100m	$100

KEYBOARDS

Acer Accufeel Slim	$20
BTC 5199	$15
Fujitsu Internet	$35
Logitech Internet Navigator	$75
LG Cordless Combo	$85
Ms Internet Keyboard Pro	$80
Microsoft Internet OEM	$40
Ms Natural Keyboard Pro	$110
Ms Office Keyboard OEM	$80
Ms Wireless Combo OEM	$130
Ms Internet Combo	$65
Logitech Optical Freedom	$210
Mitsubishi Multimedia	$40
Click Black Keyboard	$25
Mini Silver Keyboard	$65

MODEMS

Aopen 56k v.90 Ext	$85
Dynalink 56k external	$90
Mitsubishi Internal 56k	$40
Netcomm Internal 56k	$40
Netcomm Rave 56k USB	$115
Lucent Internal	$35
Pragmatik External	$75
Swansmart Internal 56k	$40
USRobotics Ext56kMsg	$175

MICE

A4Tech Optical PS/2	$45
Aopen PS/2 Scroll	$15
Genius PS/2 Scroll	$15
Genius Optical PS/2	$45
Logitech Dual Optical	$85
Microsoft Intelimouse Opt	$50
Microsoft Explorer Opt.	$60
Microsoft Intelliweb	$30
Microsoft Intelliweb Opt	$50
Microsoft Explorer Opt v3	$85
Black PS/2 Mouse	$15

GRAPHICS CARD

Asus 64mb Gf2 MX400	$130
Asus V770GF2 DLX 64mb	$350
Asus V8170 GF4MX440	$215
Asus V8440 GF4 128MB	$555
Asus V8460 GF4 128MB	$790
Hercules Ati AIW 8500DV	$690
Leadtek Gf2 MX-400 TV	$130
Leadtek Gf3 Ti-500 64mb	$395
Leadtek Gf4 Mx440 64mb	$199
Leadtek Gf4 Ti4200 64mb	$399
Leadtek Gf4 Ti4400 128m	$555
Leadtek Gf4 Ti4600128mb	$730
Matrox G550 32mb Dual	$295
MSI Geforce4MX420 TV	$180
MSI Geforce4MX460 TV	$330
MSI Geforce4TI4660VIVO	$830
Gainward Gf2 Mx400 64m	$130
Gainward Gf4Mx440 64m	$225
Gainward GF4-4200 128	$475
Gainward GF4-4600 128	$795
PCI Mx400 64mb TVOUT	$175
Triplex Gf4 Ti4600 128mb	$695

MOTHERBOARD

ABIT KR7ARaid	$250
ABIT KR7A-133	$225
ABIT KR7A-133 Raid	$275
ABIT AT-7	$395
ABIT IT-7	$430
Asus P4B266 USB 2.0	$310
Asus P4B266-SE USB1.1	$275
Asus P4B533-E RAID	$415
Asus P4B533	$350
Asus P4T-E RDRAM	$365
Asus P4S333-C P4 DDR	$210
Asus A7M266D Dual AMD	$580
Asus A7V266-Raid	$295
Asus A7V333	$245
Asus A7V333-RAID	$310
Asus CUPLEVM	$129
Asus P4S133-VM	$190
ECS K7S5A DDR/SDR	$115
Epox 8KTA3L+	$150
Epox 8K7A+	$200
Epox 8K3A	$195
Epox 8K3A+	$230
Epox 4BDA2+ Raid	$250
Epox 4G4A+ Raid	$280
Gigabyte 6VTXE-A	$160
Gigabyte 8IRX	$180
Gigabyte 8IEX	$240
Gigabyte 8IEXP	$315
Gigabyte 7VRX	$210
Gigabyte 7VRXP	$235
MSI K7T266A	$200
MSI Nforce 420 Pro	$295
MSI Kt333 Ultra	$220
MSI Kt333 Ultra RAID	$270
MSI 6533 P4 DDR	$190
MSI 6368 Socket 370	$135
MSI Dual P3 +Lan&Raid	$320
MSI 845E Max2 Raid	$295
Soltek 75 DRV4	$180
Soltek 75 DRV5	$199
MSI Nforce TV Out option	$50

CABLES

IDE cable 1m (6 plugs)	$15
ATA 100 IDE 45cm.....	$10
ATA100 60cm Rounded	$20
ATA100 75cm Rounded	$25
ATA100 85cm Rounded	$29
ATA100 IDE100cm	$15
Rounded Floppy (red)	$15
CAT5 Rj45 2m	$8
CAT5 Rj45 5m	$15
CAT5 Rj45 10m	$20
CAT5 Rj45 20m	$25
CAT5 Crossover 2m	$10
CAT5 Crossover 5m	$15
CAT5 Crossover 10m	$20
CAT5 Crossover 20m	$30
VGA RGB BNC Monitor	$30
5.25 Power splitter	$5
Power Cable	$7
Power Extension	$15
Parallel Printer	$5
USB Cable 2m	$10
USB Printer 5m	$15
USB Extension 2mb	$15
PS/2 2m Extension	$7
Monitor 2m Filtered	$20
Monitor 2m Extension	$20
Audio CD Cable	$2
Telephone Accessories	$call
Audio cables	$call

CONTROLLERS

Tekram DC315 SCSI	$50
Tekram DC390U3W	$395
PromiseUltra ATA100Tx2	$65
PromiseFTrackATA Tx2	$220

CAMERA

Canon PS A-40	$765
Intel Easy PC	$45
Intel Qx3 PC Microscope	$175
Kodak 64mb Flashcard	$99
Kingmax 32/64mb CF	$60/$95
Smartmedia 64mb	$95
Kodak Dx3215	$425
Kodak DX3600 W/Dock	$635
Kodak DX-3700	$690
Camera bags compact	$35
Camera bags deluxe	$65

ACCESSORIES

Arctic Silver 3 Tube	$20
Copper Shim	$10
8cm case fan	$9
Digidoc 5	$130
Standing Microphone	$10
Altec Lansing Headsets	
AHP5	$25
AHP10	$30
AHS20	$35
AHS30	$40
Caselogic 24 cds wallet	$15
Caselogic 72 cds wallet	$50
Caselogic 88 cds wallet	$65
Caselogic 208 cds wallet	$80
Atlantic CD wallet 208cd	$50
Rotary Mouse pad	$15
Gel filled wrist mousepad	$20

FLOPPIES

1.44 Panasonic	$25
1.44 Sony	$25
1.44 Teac (Black)	$35
100mb Iomega Zip IDE	$130
250mb Iomega Zip IDE	$195

OEM SOFTWARE

Microsoft WinXP Home Ed	$199
Microsoft WinXP Pro	$330
Microsoft Win2000 Pro	$310
Microsoft Office XP Pro	$520
Microsoft Office SBE	$385
Microsoft Work Suite 2001	$140
Microsoft Work Suite 2002	$165
Norton Anti Virus 2002	$60
Roxio Easy CD Creator v5	$25
Power DVD V3.0	$15

UPS

OPTI-UPS	
Power VS-II 500Va	$165
OPTI-UPS 525BT	$195
OPTI-UPS 420ES	$350
OPTI-UPS 650ES	$450

TV TUNERS

Pixelview FM Tuner	$120
Winfast TV2000XP	$140
Winfast SmartTV JR	$185
Pinnacle Studio PCTV	$150

GAME DEVICES

Saitek Gamepad	$60
Saitek Cyborg 3D Jstick	$75
Sidewinder Gamepad	$45
Sidewinder GameVoice	$80
Saitek Steering Wheel	$90
Logitech Momo Force	$450

USB/1394 DEVICES

Surecom 4port HUB	$55
Surecom 7port HUB	$85
Surecom 2portPCIUSB	$40
Webstar Firewire 1394	$79
Webstar 2port PCIUSB	$40
2.5" External USB 2.0	$150
USB Pen drive 16mb	$60
USB Pen drive 32mb	$99
USB Pen drive 64mb	$170
USB Pen drive 128mb	$270
USB 24x10x40 Liteon	$350

UPGRADE SPECIALS

ASUS A7VL133-VM + DURON + FAN $280

ASUS A7V266-E + Xp1700+ + FAN $490

P4 1.6GHZ + MSI MOTHERBOARD $520

INTEL P3-1000 + MOTHERBOARD $450

DURON 950 + ECS K7S5A+ FAN $250

OFFICE SYSTEMS

Intel Celeron 1200 $1050
Intel P-IV 1.6 $1220

Intel Motherboard
256MB SDRAM PC-133
40Gb 5400rpm ATA100
1.44 Mb Floppy Drive
52x IDE CDROM
15" SVGA Monitor
Integrated AGP Video
Integrated AC97 sound
120 watts Speakers
Windows 98 keyboard
Mouse and pad
ATX MIDI Tower Case

AMD Duron 1000 $990
AMD Xp1800+ $1100

Amd Motherboard
256MB SDRAM PC-133
40Gb 5400rpm ATA100
1.44 Mb Floppy Drive
52x IDE CDROM
15" SVGA Monitor
Integrated AGP Video
Integrated AC97 sound
120 watts Speakers
Windows 98 keyboard
Mouse and pad
ATX MIDI Tower Case

Add $199 for WinXP Home
Add $20 for 7200rpm HDD

Add $20 for network card

GAMING SYSTEMS

MIDRANGE GAMING

AMD XP 1900+ $2090
AMD XP 2000+ $2140

Latest AMD Motherboard
256MB PC2100 DDR RAM
80Gb Hard Drive 7200rpm
17"Flat Screen monitor
1.44 Mb Floppy Disk Drive
Asus Geforce2 TI Deluxe
Sound Blaster Live De 5.1
Creative Inspire 2400
Microsoft Internet Keyboard
Microsoft IntellimouseOptical
ATX Midi Tower 250watts
16x IDE DVD ROM

Intel Pentium IV 1.8 $2175
Intel Pentium IV 2.0 $2245

Latest Intel Motherboard
256MB PC2100 DDR RAM
80Gb Hard Drive 7200rpm
17"Flat Screen monitor
1.44 Mb Floppy Disk Drive
Asus Geforce2 TI Deluxe
Sound Blaster Live De 5.1
Creative Inspire 2400
Microsoft Internet Keyboard
Microsoft IntellimouseOptical
ATX Midi Tower 250watts
16x IDE DVD ROM

UPGRADE OPTIONS:
LITEON 32X12x40 $135
UPGRADE TO 19" ADD$120
ADD WINXP HOME ED $199
ADD WINXP PRO $330

NFORCE SYSTEMS

AMDXP1800+ $1450
AMD Xp1900+ $1540
AMD Xp2000+ $1570

MSI Nforce 420 Pro
256MB PC-2100 DDR
40Gb Hard Drive 7200rpm
17" SVGA Digital Screen
Onboard Nvidia Gf2mx Video
1.44 Mb Floppy Disk Drive
SoundWorks SW320
Multimedia Internet Keyboard
Scroll mouse
ATX MIDI Tower case
16x48 DVDROM
Onboard 10/100 LAN
Onboard 6 channel Audio

UPGRADE OPTIONS:
LITEON 24X10X40 $130
UPGRADE TO 19" ADD$120
ADD WINXP HOME ED $199
ADD WINXP PRO $330

SYSTEMS SALE:

BONUS 2x HOYTS MOVIE TICKETS FOR FOR EVERY SYSTEMS (MUST MENTION THIS OFFER WHEN BUYING TO CLAIM

VISIT OUR WEBSITE FOR LATEST PRICING AT:

Www.scorptec.com.au

AUSTRALIA'S PREMIERE ONLINE COMPUTER SHOP

SCORPION TECHNOLOGY COMPUTERS

13 Royton St. East Burwood
Vic. 3151. Melbourne
Ph. (03) 9886 1615
Fax. (03) 9887 8560
Email: sales@scorptec.com.au

TRADING HOURS:
MON - FR I: 10AM- 6:00PM SATURDAY : 10AM - 3PM, SUNDAY : CLOSED
DIRECT DEPOSIT BANKING DETAILS: BANK OF MELBOURNE

Prices subject to change without notice. Errors & Ommissions excepted. Advertised price are strictly for CASH/BANK CHEQUE only. Price dated from: 27/6/02. All logos and brands are trademarks of the respective companies. All major credit cards accepted, as advertised prices are cash only, 2% surcharge applies for creditcard payment

THERMO EFFICIENT NETWORKING APPLIANCES AND CASING

IPC-4032 4 U rack-mount aluminium chassis

Features include:

- Standard design 19" EIA
- Drive bracket: 5.25" x 3 + 3.5" x 2
- Heavy duty SPCC t: 1.2 aluminium construction
- Supports different versions of ATX, Baby-AT and Backplane motherboards
- One Al. re-enforcement bar for interface card stabilised with 2 x 8cm fan
- One 12cm cool fan & air filter in front
- Lockable front door
- Standard ATX 300W PS/2 power supply or hot-swappable redundant power supply optional
- Dimensions: 178mm(H) x 422mm(W) x 531mm(D)

From only $468 RRP

MSR-4620 all aluminium case (without power)

Features include:

- Tough die cast aluminium front panel
- Anodized aluminium alloy chassis
- Special conductive surface treatment
- Includes two 12cm side-panel fans and one 8cm rear fan
- Two additional front 8cm fan mountings
- Removable motherboard tray
- 12 drive bays
- Listed on Intel reseller centre Website
- Dimensions: 208mm(W) x 442mm(H) x 490mm(D)

Only $288 RRP

ATX4378 aluminium ATX case (without power)

Features include:

- Anodized aluminum alloy chassis
- Special heat conductive design
- Keeps system 8-16ºC cooler compared to steel
- Lightweight – only 3.6kg – half the weight of steel
- Corrosion and oxidation resistance
- Easy to remove thumb screws
- Dimensions: 200mm(W) x 411mm(H) x 445mm(D)

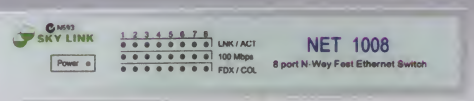
Only $168 RRP

NET – 1008 8-Port 10/100Mbps – N/Way Fast Ethernet Switch

Features include:

- Auto Negotiated flow control & Half/Full Duplex operations
- Broadcast storm control
- Rich Diagnostics LEDs
- Internal Power Supply
- Weight: 700g
- Limited Warranty: 1 year

From $99 RRP



For information and prices:

www.skyhawkgroup.com

email: skyhawks@hotkey.net.au

(02) 9790 6647

Reseller / OEM / ODM / enquiries welcome

THIS IS NOT A COOL AD

Ailean.com.au is not the ultimate gaming site; it's not the biggest; and it's not even the cheapest (but it's close).
You won't find any Flash media bits or Fireworks – hell, you won't even find a shopping cart right now.
But if you want the best gaming experience you can afford, we want to help you get it.

Why is this guy here?

If only he knew we stocked the following vendors' products: Intel / Vantac / ASUS MSI / GlobalWin / LeadTek / Hercules Creative / Fujitsu / Mitsubishi / Hewlett Packard / Kingston / Lian Li / AMD / EPOX ZALMAN / Macase / Kingmax / Logitech Western digital / Adaptec / Canon / Hynix

And he definitely doesn't know about a little group I like to call 'Non Specific Up There' which makes all the case mod stuff: neons, windows, cables, thermal compound, epoxy conductive paste etc. All Ailean systems are built with Arctic Silver 3, burnt-in for 24hrs and warranted for 3 years.

Note the lack of prices in this ad: that's because it was submitted over a month prior to publication. Putting prices in a magazine is a bit like peeing yourself in a dark suit: it makes you feel all warm, but no-one takes any notice. Check our Website instead for up-to-date info. www.ailean.com.au

WARNING: This ad contains BRUTAL honesty for all ATOMICANS who like to play games...
But it definitely won't DAMAGE YOUR HEALTH

Ailean: performance products & machines for gamers
www.ailean.com.au / email: Sales@ailean.com.au / phone:(02) 6282 2677 / fax: (02) 6203 3707
We accept all payment gratefully, either as a Direct Deposit, or payment from your Mastercard, VISA or BankCard.
Cash is also good – but you need really, really long arms, unless you live in the ACT.

Programmer's Paradise Pty Ltd

FULL PRICE LIST !

And On-Line ordering available from our web site

OVER 30,000 Products Available

STORAGE SALE!

Ultra IDE hard drives

	Inc GST
Seagate 40GB, Barracuda IV 7200RPM	$150.00
Maxtor 40GB VIPER D740X ATA133	$190.00
Seagate 60GB, Barracuda IV 7200RPM	$195.00
Seagate 80GB, Barracuda IV 7200RPM	$215.00
Maxtor 120GB Ultra IDE, ATA133	$380.00
Maxtor 160GB Ultra IDE, ATA133	$585.00

SCSI hard drives

	Inc GST
Seagate 18.4GB Ultra160 Barracuda	$ 410.00
Maxtor 36GB Ultra160 Atlas . 4.5ms	$ 635.00
IBM 36GB Ultra160 - Discovery-2	$ 855.00
Seagate 36GB Cheetah 15000rpm, 3.7ms	$ 855.00
Maxtor 73GB u160, Atlas 10K III, 4.5ms	$1325.00
Seagate 180GB - Barracuda 180, 7.4ms	$2900.00

CDRW drives

	Inc GST
Panasonic CD-RW Blaster 24x 10x 40x Kit	$ 135.00
Ricoh 32x10x40 IDE RW with software	$ 235.00
Liteon 40x 12x 48x CDRW	$ 165.00
Liteon 48x 12x 48x CDRW - FAST!!	$ 225.00
Sony 32x10x40x retail CD-RW kit	$ 225.00
LaCie 16x10x24x USB2.0 & fastFireWire	$ 625.00

External Enclosures

	Inc GST
Datafab Firewire 2.5" IDE enclosure	$ 165.00
Momobay - 2.5" IDE- FireWire & USB	$ 180.00
Datafab - 3.5" IDE HDD - USB 2	$ 190.00
Datafab - 3.5" - FireWire2 + USB2	$ 265.00
Datafab - 5.25" ATAPI devices - USB	$ 180.00
NewMotion - 5.25" - Firewire + USB	$ 295.00

DVD drives

	Inc GST
LaCie SuperDrive DVD-RW/CD-RW	$ 1195.00
Panasonic Rambo DVD-R/RAM	$ 895.00
Sony 16x40x DVD/CD drive - bare drive	$ 99.00
Realmagic DVD decoder w/ remote	$ 240.00
Ricoh DVD+RW Drive, with NERO	$ 855.00
Laser DVD+RW 4.7G media	$ 13.00

System components

	Inc GST
Macase KA-130, Blue w/ door & 300w PSU	$ 270.00
Skyhawk Aluminium Mini-tower (no PSU)	$ 190.00
CPU Fan + Heat Sink HHC-001 water cooler	$ 75.00
8-Port 10/100M NWay Full duplex Switch	$ 75.00
X-Micro GeForce 4 Mx420, TV Out, 64MB	$ 170.00

*** More products on our web site ! ***

www.programmersparadise.com.au

(02) 8850 2133 (02) 8850 2355

email: paradise@zip.com.au

Free delivery on Samsung monitors - Australia Wide!!!

bankcard VISA MasterCard AMERICAN EXPRESS

All products sourced from the Australian Distributors, Overnight delivery available. Call for best price !
Bankcard/Mastercard/Visa/Amex , Govt&Corporate orders welcome. Prices updated daily.
Programmer's Paradise Pty Ltd. ABN.22 071 038 036 .e&oe. Subject to change without notice, 19/06/2002

www.thermaltake.com

Performance Cooled By Thermaltake

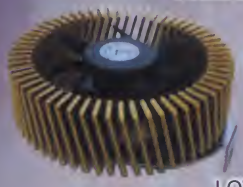
Proudly distributed by Anyware™ COMPUTER ACCESSORIES

VOLCANO 7+

INDIGO ORB

CHROME ORB

MINI SUPER ORB

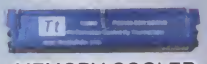

LOW PROFILE ORB

BLUE ORB

STORM YOYO FAN

ORANGE ORB

CRYSTAL ORB


MEMORY COOLER

VOLCANO 2

GOLDEN ORBSOCKET 370

GOLDEN ORB SLOT1

VOLCANO 7

COPPER SHIM

MINI COPPER ORB

VOLCANO 6

DRAGON ORB

GOLDEN ORB SLOT A

Anyware™ COMPUTER ACCESSORIES

Australian Importers & Wholesalers www.anyware.com.au

SYDNEY
No 3, 14 Tennyson Rd, Gladesville, NSW 2111
TEL: 02-9879 5788 FAX: 02-9879 5388

MELBOURNE
42 Henderson Rd (Off Laser Drive), Rowville, VIC 3178
TEL: 03-9763 8200 FAX: 03-9763 8400

PERTH
Unit 2, 9 Leeway Crt, Osborne Park, WA 6017
TEL: 08-9242 8588 FAX: 08-9242 8688

Reality bytes

Picture this: as the sun begins to set over Manhattan Island, thousands of weary business people thread their way home. Then, through the forest of mirrored buildings, a small, dark shape swings into view. One by one, people stop in the streets and crane their necks upward, watching as the red and blue figure somersaults and dives through the air. Suddenly, someone screams.

'Oh my gawd – he's shooting webs out of his arse!'

Strictly speaking, that's what it should be like. The superhero in question (we'll call him 'The Arseweaver' for copyright reasons) should have woken up from his spider bite with six to eight eyes, spinnerets in his bum, and a taste for window cleaners. Instead, we get a guy with a six-pack and a seriously hot girlfriend.

There's an interesting lesson here (no, not that you should try to get bitten by a spider so you don't have to work out). It's how far we're prepared to bend our suspension of belief. We watch movies with special effects that can literally bend reality. But at the same time, we're asked to believe things that just don't make sense.

We hate to say it, but computer games are becoming the same. The piccies are getting so good they almost hurt. Add a new Parhelia vidcard to some of the latest games from E3 and, by all accounts, you'll get so damn close to reality it hurts. Already we see cars that reflect buildings, bad guys that drip sweat, and buxom women that. . . well. . . jiggle (check out Tina Armstrong in DOA3 – cor blimey. . .).

But still, some things just don't add up. Take Black & White for instance, the game that was supposed to use revolutionary 'artificial intelligence' (maybe that should start with an 'f' – 'Geez, what's in those fields? Beans and cabbage?'). Choose the cow creature, and your first move is to teach it how to eat. Straight off this is plainly ridiculous – what animal in its right mind doesn't know to eat if it's feeling hungry? If the cow had any sense at all it would conjure up a bunch of ringpulls and rename all the villagers 'snackpack'.

Likewise with Age of Empires. We did a quick Atomican survey to see what people would do if a marauding clan wiped out their village. About fifty percent said they'd hide behind the bushes; the other half said they'd fight with every bucket and pitchfork they owned. Granted, we only surveyed two people (and Ben lied about the bucket thing), but it makes sense NOT to stand still, right? Oh come on people! How do you expect to reach the Iron Age if you can't even hide like little girls (and backpage columnists)?

Final example: the kid on that damn Oreos ad. Now we know what you're going to say – that's not a computer game. Okay, good point. But it is an example of truly amazing special effects. Here's a fat little kid eating biscuits and teasing a dog. Sure, the kid looks real (all slobbering mess and accent) and the fur on the dog actually seems to move with the wind. But if this was reality, that dog would probably sit still for about one to two bites, then maul the child senseless and forget all about the bikkies. And no child could really be that annoying. You've got to hand it to their animators: it's pretty amazing the insane lengths they'll go to sell an American icon (oh, did we mention Britney Spears?).

Well, you're probably thinking now that we're complaining about the lack of common sense in our games. Frankly, we couldn't give a toss. The more jiggling and non-arse web spinning we get, the better. It helps take our minds off those bratty kids with chocolate all over their faces, showing us how to dunk it and twist it.

If only Tina Armstrong did the same. . .

John Simpson

Maxtor®

Innovative Storage Solutions

Your customers need space to unleash their creativity...

Photos

Games

Videos

Music

Maxtor's product family meets the needs of all users, in terms of connectivity, capacity, speed, transfer rate and price.

Personal Storage 3000XT 160GB FireWire

Designed for users who demand maximum capacity and great performance. Each easy to install 160 GB unit stores up to 13 hours of DV format video, 40,000 MP3 tunes, 160,000 high-resolution digital photos, or 4,000 video games. The 3000XT allows you to run applications, play videos, listen to music, download files, or play games without the worry of filling up you system's internal hard drive.

Personal Storage 3000DV 60/80GB FireWire

With its 7200 rpm hard drive and innovative electronics, this new model - which is a complement to the external storage range - is proving to be up to 56% faster than its 40 and 80 GB predecessors. Video game users can store up to 75 CD-ROM and get the performance they need for real-time response.

Personal Storage 3000LE 40/120GB USB 2.0

Maxtor's latest external hard drive is a genuine technological innovation. With new USB 2.0 connectivity, it offers users a transfer rate of up to 480 Mbps and an additional 40 GB of storage that is easy to install and compatible with any USB-enabled computer.

www.maxtor.com

Available from all Leading Retailers

we recommend CREATIVE INSPIRE Speakers

Sound BLASTER® Extigy™

The **Heart** of a **High Performance 5.1 Audio System**

The **Soul** of a **Sound Blaster®**

[yes, it's EXTERNAL!]

Sound Blaster® Extigy™ makes it easy to listen to your CDs, MP3 collection, music videos, or Internet radio on your PC with stunning 24-bit audio and 100dB SNR clarity. You can playback all your stereo content in rich 5.1 surround sound with Creative's proprietary CMSS® technology. The included EAX® ADVANCED HD™ music effects allow you to personalize and enhance your music. And Sound Blaster® Extigy™ can also be used with your notebook or Dolby Digital® compatible consumer electronic devices like gaming consoles and set top DVD players.

With convenient external USB connectivity, you can hook up the Sound Blaster® Extigy to your PC in one simple step. Upgrading your PC to high performance 5.1 audio couldn't be easier!

Intrigued?

Visit **www.soundblaster.com**

24bit 96kHz/100dB SNR

EAX ADVANCED HD™

DOLBY DIGITAL

Creative Labs Pty Ltd
Unit 10 Discovery Cove 1801 Botany Rd,
Banksmeadow, NSW 2019
Tel: (02) 9666 6100 Fax: (02) 9666 6900
Website www.australia.creative.com

CREATIVE®

©2002 Creative Technology Ltd. The Creative logo is a registered trademark of Creative Technology Ltd. in the United States and/or other countries. All brands or product names listed are trademarks or registered trademarks and are property of their respective holders.